# JAPANESE LABOR MARKETS AND SUBCONTRACTING

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# and

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# I. Introduction

## Overview

This paper makes two points. The first is an empirical one, that the employees of a Japanese firm are very homogeneous; firms are observed to pull their employees from only one segment of the labor market. The second is a theoretical one, that the consideration of factor market imperfections, such as the homogeneity discussed herein, is important for developing a more complete theory of the firm. Organization functions as a substitute for markets, and its form reflects their structure and faults.

In this context, the important facet of homogeneity is that management is constrained from making distinctions in compensation among a firm's employees. This is obvious in large Japanese firms, with their enterprise unions; what this paper stresses is that homogeneity is a general feature of Japanese firms, large *or* small. The second contribution of this paper, motivated in part by this observation, is to introduce a new strand to the theory of the firm. Here it is claimed that identifiable factor market imperfections are important in determining the scope of the firm, and in particular serve as a force for dis-integration. In this it complements existing theories based on transaction costs and market power, which present reasons why firms should exist (activities be integrated).[1]

In the manufacture of most products, a variety of labor inputs are required, e.g., skilled and unskilled. But homogeneity means that a firm is constrained from employing differing types of workers *at different wages*. Hence, for static efficiency, a firm will subcontract processes which require workers who are, in the labor market, paid less (or more) than its own employees. Elsewhere the author details the wide extent of such subcontracting in Japanese manufacturing, particularly in the automotive industry, though a brief overview is presented below. Instead, the bulk of this paper consists of a presentation of evidence for this homogeneity, from case studies drawn from the author's research in Japan, from standard statistical sources, and through a review of the secondary literature on Japanese labor relations.

Similar imperfections in capital and other factor markets are not discussed herein; the author, in any event, believes that (at least in the Japanese case) labor market imperfections are the most important for understanding subcontracting. Again, the central concern of this paper is to demonstrate the homogeneity of labor in Japanese firms, and to present one implication of this for the theory of the firm. In keeping with this narrow focus, no systematic evidence is advanced concerning the extent to which homogeneity is a general feature of labor markets.

Several illustrations are provided, however, which suggest that the phenomena described herein are not uniquely "Japanese", but are also important in the US economy.

## Organization

Following this introduction, Section II presents an overview of theories of the firm, highlighting the contribution of this research to that theory. A brief description of subcontracting in Japan is also included. Section III is the first of two on labor markets; it contrasts the range of (market) wages found in Japan with the relative homogeneity of the workforce in Japanese firms. Because of their aggregate nature, standard statistical sources are incapable of providing detail at the firm level; case studies are utilized as an essential, complementary data source. Section IV delves into the sources of this homogeneity, primarily through a review of the literature on labor relations in large Japanese firms. Section V raises several issues which are beyond the scope of this paper, including generalizations to the US labor market. Section VI briefly summarizes the paper.

## II. Background and Theory of the Firm

This section provides an overview of subcontracting in Japan in the automotive industry as background, and then surveys the theory of the firm. Following that, it argues that economic activity generates a demand for heterogeneous labor inputs. It then traces the implication of this in a firm-theoretic context when firms employ homogeneous labor. Subsequent sections demonstrate first the range of heterogeneity available in the Japanese labor market and second, that in comparison the labor employed within firms is homogeneous.

### Background: Subcontracting in Japan

Manufacturing in Japan is organized in distinctly smaller units than in the U.S.; the decision to "buy" has been taken more frequently, relative to a US choice of "make". For example, the Japanese automobile manufacturers purchase 70% of the parts incorporated into their vehicles; GM purchases 40%. Furthermore, most of this difference stems from the purchase of parts which are unique to a specific model and require specialized assets for their production.

One indication of this difference is to note that General Motors employs 440,000 in the U.S. alone (three quarters of a million world-wide); in manufacturing as a whole, only 15% of Americans are in establishments with under 50 employees. Firms in Japan, however, are in general smaller for a given volume of output. For example, Nissan and Toyota have between them 110,000 employees -- 1/4 the size of the U.S. portion of GM -- while producing 25% more vehicles. (The inclusion of their subsidiaries roughly doubles their employment, which still leaves a two-fold difference in size.) GM may be somewhat less efficient, but not by nearly a factor of 3 difference; clearly the Japanese firms "buy" relative to GM's "make".[2] Similarly, in manufacturing as a whole, nearly half (46%) of the Japanese workers are found in establishments of less than 50 employees.[3] This is not a statistical artifact, due to a preponderance of small-firm dominated ("light") industry; most industries have more small-firm employment than in the US.

Despite the greater utilization of purchased parts in the automotive industry, Toyota, Nissan and the other automotive firms each have only 200 to 300 "primary" suppliers from whom they purchase parts and components for use in assembly. Each of these firms in turn has a network of suppliers. This "secondary" group of 2,000 or more (in general smaller) firms produces parts for incorporation into components by "primary" suppliers, or in some cases merely to be channeled by "primary" firms to the assemblers. "Secondary" suppliers are in turn supported by a tier of several thousand (and in general quite small) "tertiary"

subcontractors. In contrast, GM has 3500 direct suppliers of parts for assembly, and over twice that number when tooling, materials and non-production item suppliers are included.

While not detailed in this paper, the author's research indicates that subcontracting was quantitatively and qualitatively different before 1950. Among other differences, "generic" processes ("drilling a hole") rather than "parts" were subcontracted. Parts subcontracting began to develop rapidly with the Korean War boom, when production expanded during a period of labor unrest. Further expansion occurred from 1960, as modern assembly lines were introduced in a tightening labor market. There is thus an evolution of practices, with some correspondence of changes in subcontracting to changes in the labor market.

The Japanese auto firms also use far fewer suppliers for each item, in the extreme only one per model-specific part, and two suppliers for that type of part across all model lines. The items they purchase are also on average more complex than in the US. The Japanese firms are much more likely to purchase subassemblies, such as entire seats; US automotive manufacturers instead purchase springs, material and so on and assemble seats themselves.[4] Unlike the facilities needed to manufacture springs, those to make more specialized components and jigs and lines for carrying out assembly are highly model-specific.

Such specificity gives rise to a bilateral monopoly between parts producer and vehicle assembler; the transactions cost literature suggests that the ensuing bargaining problems will lead to vertical integration of such firm-specific production. This has not occurred in Japan to the extent it has in the US, and this paper argues that one reason for this is the structure of of labor markets in Japan, which makes it relatively costly to organize the variety of operations required in manufacturing a vehicle within one firm.[5] (Elsewhere innovations in contracting practices which serve to reduce contracting costs are discussed.)

## Theory of the Firm

Why should this be so? And how is this relatively larger "market" in Japan organized? The latter question will be left for another occasion; herein the former is addressed, in the context of theories of vertical integration. Economic theory has offered several answers; most commonly, though, it has ignored the issues altogether, by positing perfect and frictionless markets where "firms" as we know them do not exist, or where they are a "black box" which, once the relevant comparative static responses are known, need not otherwise be examined. While clearly a fruitful approach for many issues, it fails to give any insight into why firms exist or assume a given size, or what their economic role is, relative to "markets". A second, and

again largely empty theory is that firms exist because of physical (technological) jointness: a continuous caster must of necessity be in the same firm as the steel furnace; few equally compelling examples can be found, and counterexamples abound.[6] That firms exist because they must is not a very useful insight.

Until recently, the largest strand of literature was related to antitrust. In this literature it is argued that when prices do not reflect opportunity costs, as occurs with monopoly, vertical integration can enhance profits. Where the purchaser, for instance, faces a monopolistic market for an input into production, one response is to integrate backwards, so that the firm can now base its production decisions on the basis of (internal) marginal costs rather than the (excessive) market cost. Unfortunately the theory suggests no disadvantages to vertical integration; since market imperfections of one or another sort are pervasive, the same logic implies that the entire economy should be "organized". It does provide a theory of why firms may be preferred to markets, but at the cost of excluding markets.

Government-instituted market distortions or other policies are another possible influence on firm boundaries. A firm may be granted a legal monopoly in the form of patents, and as argued above this provides a rational for vertical integration. In the case of patents, however, only if a merger can be arranged can a downstream user of the patented good do this, and in Japan mergers for institutional reasons are relatively unusual, especially among large firms; Aoki [forthcoming], among others, discusses some of these factors. Automotive industry examples here might include power steering and braking systems -- and in both cases automotive firms managed eventually to lessen the monopolistic position of such suppliers through joint ventures.[7] A second type of example comes from items in the tax code or other barriers to interfirm transactions. Output taxes (sales taxes on interfirm sales as well as to consumers) are imposed in some developing countries, making it advantageous to organize operations in-house that would otherwise be kept independent. Similarly, the lack of reliable markets in centrally-planned economies leads to extensive vertical integration in the Soviet Union. One example in the Japanese case is that firms legally classified as "small and medium enterprises" enjoy certain tax advantages and access to small business financial institutions, although this advantage is small and seems to have been utilized primarily by closely-held firms.[8]

The most useful approach to date has been to remove the assumption that economic activity can be organized without friction or cost. The transactions cost theory (Williamson [1985]) develops a theory of determinants of these costs, with "asset specificity" the primary datum used to distinguish those transactions which are organized at less cost in markets from those more efficiently organized within firms. It does this by stressing

the opportunism and bounded rationality of agents, which make contracting ("markets") difficult when the assets involved are specific, relative to the governance mechanisms available internal to firms. In the words of Williamson ([1975], p. 124):

> Shifting a transaction from the market to the firm is significant not because a small-numbers exchange relationship is eliminated but rather because the incentives of the parties are transformed.

This paper seeks not to deny the transactions cost approach. The uniqueness of many if not virtually all parts in an automobile to a specific model suggests that transactions costs will be an important explanatory factor of vertical integration by automotive firms, and this has been born out by research on the U.S. industry (Monteverde and Teece [1980, 1982]). In the case of Japan, the activities incorporated in the eleven domestic manufacturers are common to all auto manufacturers, no matter the nationality. The Japanese firms, like their rivals in the US and Europe design, coordinate marketing, carry out final assembly, make large stampings, and cast, machine and assemble the engine; most firms also assemble and manufacture key components of the steering assembly and transmission / drive train. All of these are processes which are highly specific to automotive production; the author, for example, is familiar with no other industry which makes use of large stampings (such as fenders) or large, high volume castings (engine blocks).[9]

The theoretical approach presented below complements these existing models. The claim here is that it is necessary to examine the structure of markets, not merely in terms of monopoly, but rather of institutional and other imperfections. In particular, here it is argued that the structure of labor markets in Japan, as detailed below, shifts at the margin the decisions of firms to subcontract or to vertically integrate. While this possibility have been referred to in the literature, it has been done as an afterthought[10]; such failures are implicitly treated as being either uninteresting or unimportant. To reiterate, the model presented here argues that they are in fact important. (In addition to labor markets, the dissertation chapter from which this paper is drawn will also discuss capital markets.)[11] Next a model of the demand for heterogeneous labor is developed. The importance of homogeneous labor for the theory of the firm will then be apparent.

## Heterogeneity: Theory

The production of an auto or other assembled product requires a tremendous range of materials, capital goods, manufacturing processes and design and management services. Not only the quantities, but also the qualities of labor required vary substantially, from (potentially) a "human" machine for

installing widgets in a mindless (but difficult to automate) fashion, to skilled engineers in design work. These differences are qualitative, not merely quantitative: a worker "on the line" typically cannot carry out design work, while an engineer is capable of performing assembly work, and probably with as much efficiency. Thus, individual efficiency and human capital accumulation aside, labor inputs must be disaggregated, and economic logic (where wages in equilibrium correspond to the marginal product of labor) suggests there is no *a priori* reason to expect compensation for such dissimilar workers to be equal.

In terms of observables, individuals in the labor market are commonly classified by various characteristics, such as age, education, prior experience, geographical location and gender. Now at a given point in time and hence with a given (and probably quite limited) range of "technologies", a firm or entrepreneur will wish to utilize various types of labor services incorporating certain skills. There will be some ability to substitute other types of services (at different wages), but as a first approximation production technology is a function of product design, while the inter-relatedness of most parts in an automobile makes even incremental design change costly.[12] Given a relatively fixed technology, efficient production requires that one be able to employ labor appropriate to the task at hand.

The heterogeneity of production processes and labor types implies there can be no expectation *a priori* that (efficiency-adjusted) wages measured in a common unit of time will be equal; salaries can be expected to diverge substantially depending on the type of work(er). In the extreme, a certain "job" may intrinsically have a high marginal product but can be such that virtually any worker can carry it out; with competition, rents will accrue to the employer (or, with competition among employers, to the consumer). Because of the heterogeneity of labor (jobs), not every worker will be suited to every job; assignments will be made on the basis of observables. In the first instance, then, wages will be a function of age, gender, education, prior experience, verbal skills, and a few other items.[13] At the initial stages of employment only a limited range of characteristics are observable; others will only be revealed over time. Even then, certain characteristics are hard to observe, matches difficult to make at the firm or plant level.[14]

Given this model of wage determination, at entry into the labor force pay within a cohort of individuals comparable in terms of this list of characteristics should be roughly equal.[15] Until the *tabula rasa* of the new graduate (worker) is filled by experience, there may be little interpersonal difference in productivity (pay) as well. In either case, the lowest common denominator in the market at large dominates. With the passage of time, anticipated capacity is transformed into actual capabilities, general and firm-specific human capital is accumulated, and

performance at the individual level can be evaluated with greater precision. Wages can be expected to diverge.

Implications

To summarize the above, a wide range of labor types with a correspondingly wide divergence in compensation are to be expected in the production of a good such as an automobile. If, however, a firm is constrained in the extreme to employ workers at a single wage (or, more realistic and somewhat less restrictive, on a single wage scale), then employing such heterogeneous inputs internal to the firm entails a pecuniary cost. Workers at a skill/compensation level greater than the norm of the firm cannot be hired, or, having accumulated skills, will exit. Workers at a lower skill/compensation level will gladly seek employment, since they will receive unwarrantedly high compensation, above what they would otherwise obtain in the market.

If this is the case, then there is a clear incentive for firms to specialize in a core set of activities appropriate to the wage/skill level of the workers they have culled out of the labor market, and to seek to subcontract work to (or act as a subcontractor to) firms with labor from higher- and lower-wage segments of the market. Where "markets" for the relevant products exist, this presents no problems, but for a good such as an automobile, much of the production is highly model-specific, and so transactions cost considerations suggest that there will be limits on the ability to do so. Hence the "core" activities should be similar across firms, and be ones which can be identified as involving potentially serious contracting difficulties, while the periphery should vary in line with the pressure for homogeneity, e.g., for firms in different countries. (Elsewhere the author argues that there have also been innovations in managing subcontracting relationships in Japan which serve to lower transactions costs, and hence increase the extent of subcontracting.)

In any event, the force of homogeneity pressures firms in Japan to avoid vertical integration, separate from incentive issues and diseconomies of scale in management technologies (as in the loss of control literature). Similar stories can be told in terms of distortions from the ideal in other factor markets; differential access to finance in capital markets, for example, can also affect the scope of the firm, on the margin. The development of those examples will be left to another paper. The author believes, however, that at least in Japan, labor market aspects are the most important.

## III. Heterogeneity and Homogeneity in Japanese Labor Markets

### Heterogeneity in Markets

How great is the range of wages paid in the Japanese economy? The following demonstrates the wide variation found in manufacturing. Firm-level (case study) and aggregate data are then used in the next two subsections to argue that the labor force within firms is homogeneous relative to this diversity. Section IV will then detail the apparent strength and possible sources of these constraints in using varied types of labor within a single firm,[16] while the US case will be examined briefly in Section V.

The lowest wage in the Japanese labor market is that paid to part-time female labor by housewives ("*paato*") returning to the labor market after marriage and their initial child-rearing years. As is detailed later, a representative labor cost for this important segment of the labor market is ¥600 per hour, with a 35-hour workweek; almost the entirety of this is comprised of the wage, as benefits are minimal. One can readily find manufacturing establishments in Japan almost entirely staffed by such female blue-collar workers, including in the automotive industry. At the opposite extreme are the top managers of large corporations. Salary and bonuses for the directors (the top 30 to 40 managers) of the four largest automotive firms averaged ¥18 million a year in 1978, though benefits presumably increased this substantially; this was about the same level as at the smaller Nissan Diesel in 1983, a not very good year for the firm. It is probably inappropriate to convert this to an hourly rate, but assuming a 3,000-hour work-year would leave them on average with a direct compensation ten times that of *paato*, but not highly paid by the standards of American top management.[17]

That pay varies substantially should not be surprising; tables that follow will detail wages for *paato* and for male high-school graduates. First, though, the average hourly labor cost for one of the less-successful automotive firms is developed as an estimate of how costs contrast with wages. Accepting the common Japanese presumption that success is reflected in wages, this serves as a lower bound. This full-time, male, large-firm (and primarily blue-collar) compensation also contrasts sharply with that of female part-time labor.

Table 4-1 provides a labor cost estimate for Nissan Diesel, the smallest Japanese automotive firm in terms of employment. Nissan Diesel is an engine and truck-manufacturing subsidiary of Nissan that until the late 1940's had been the independent Minsei Sangyo.[18] It employed 6,970 workers as of June 1983; another 841 "employees" were *shukko* (on loan) to other firms. The average employee was 31 years old with a monthly average base

pay (wages and overtime but not bonus) of ¥204,670. Adjusted for bonuses and benefits, however, monthly compensation comes to ¥358,000 per month, 1.75 times this "regular" wage, and at ¥2200 per hour is 3.5 times that of a *paato*.

The 1984 *Chingin Kozo Kihon Tokei Chosa* ("Wage Census") provides a statistical overview of *paato* hourly wages, broken down by age and firm size; this data is presented in Table 4-2. Similarly, Table 4-3 presents the wages of high-school graduates, based on the monthly wages reported in the Wage Census. These have been adjusted for bonuses and converted to an hourly wage using the data on bonuses and hours worked reported in the May 1984 Rodo Tokei Chosa Geppo. If Nissan Diesel is taken as representative of large firms, then labor costs for large firms will be 20% higher than the wage levels reported below; alternatively, total labor costs are 75% greater than pre-bonus "base pay".

When "identical" workers (those in the same industry of idential sex, education, and age / tenure) are compared across firm size, those in smaller firms are uniformly found to receive lower compensation; this is true not only of Japan, but also of other developed economies as well as LDCs. One interpretation (and the author's view), is that this is largely due to

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Table 4-1 Per Employee Labor Costs, Nissan Diesel, FY 1983

| Item | annual | monthly | hourly | US$ |
|---|---|---|---|---|
| 1. Labor Cost of Production: | ¥3474319 | ¥289527 | ¥1810 | $12.06 |
| 2. Labor Cost of Sales: | ¥581349 | ¥48446 | ¥303 | $2.02 |
| 3. Retirement funding: | ¥109755 | ¥9146 | ¥57 | $0.37 |
| 4. Management pay: | ¥28551 | ¥2379 | ¥15 | $0.10 |
| 5. Management bonuses: | ¥7174 | ¥598 | ¥4 | $0.02 |
| 6. Mandated benefits: | ¥49928 | ¥4161 | ¥26 | $0.17 |
| 7. Other benefits: | ¥21377 | ¥1781 | ¥11 | $0.07 |
| 8. Loan subsidy: | ¥16360 | ¥1363 | ¥9 | $0.06 |
| 9. Deposit subsidy: | ¥10712 | ¥893 | ¥6 | $0.04 |
| Total: | ¥4299525 | ¥358294 | ¥2239 | $14.93 |

Notes: Data are from annual financial statements. A month was estimated as 160 hours (large-firm automotive average was 180 hours, including overtime, but Nissan Diesel was doing very poorly, so an 8-hour day was used.) Here ¥150 = US$1. Items 1 & 2 include bonus payments. The subsidies are estimated as 1% of the value of loans to and deposits by employees. Employment here (6970) does not reflect *shukko*, whose salaries are paid by the receiving firm.[19]

Table 4-2 Female *paato* wages, all industries (¥ per hour)[20]

| age | average | | % increase | | large | | medium | | small | |
|---|---|---|---|---|---|---|---|---|---|---|
| | '83 | '84 | '83 | '84 | '83 | '84 | '83 | '84 | '83 | '84 |
| 30-34 | 550 | 554 | 2.2 | 0.7 | 576 | 578 | 562 | 559 | 531 | 541 |
| 35-39 | 543 | 556 | 2.8 | 2.4 | 575 | 582 | 541 | 557 | 530 | 545 |
| 40-44 | 552 | 567 | 3.4 | 2.7 | 587 | 596 | 551 | 562 | 536 | 557 |
| 45-49 | 565 | 577 | 4.4 | 2.1 | 597 | 609 | 570 | 579 | 542 | 558 |
| 50-54 | 572 | 586 | 5.7 | 2.4 | 612 | 636 | 582 | 582 | 545 | 569 |
| 55-59 | 571 | 584 | 4.8 | 2.3 | 615 | 661 | 596 | 583 | 545 | 567 |
| all | 560 | 572 | 3.7 | 2.1 | 590 | 601 | 565 | 575 | 542 | 557 |

Source: Chingin Kozo Kihon Tokei Chosa, 1984.

The "all" classification includes those younger than 30 and older than 60. *Paato* in large firms may receive bonuses, so that the above may understate their compensation.

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Table 4-3 Male High School Graduate Wages, manufacturing (¥ per hour)

| age | large | | medium | | small | |
|---|---|---|---|---|---|---|
| | '83 | '84 | '83 | '84 | '83 | '84 |
| 18-19 | 933 | 970 | 850 | 878 | 745 | 772 |
| 20-24 | 1088 | 1112 | 984 | 1001 | 895 | 915 |
| 25-29 | 1457 | 1502 | 1256 | 1279 | 1163 | 1191 |
| 30-34 | 1780 | 1851 | 1605 | 1617 | 1466 | 1478 |
| 35-39 | 2273 | 2300 | 2000 | 1987 | 1721 | 1737 |
| 40-44 | 2678 | 2735 | 2289 | 2381 | 1983 | 1984 |
| 45-49 | 3106 | 3186 | 2642 | 2781 | 2096 | 2205 |
| 50-54 | 3195 | 3329 | 2766 | 2819 | 2048 | 2305 |
| 55-59 | ----- sample size too small to report ------- | | | | | |

Source: Chingin Kozo Kihon Tokei Chosa, 1984.

Average monthly hours worked for males in manufacturing was 188 hours for firms with 30-99 workers, 182 hours for firms with 100-499 and 178 hours for firms with over 500 workers; these estimates are from a different sample base than the wage data. The bonus used was, respectively, 4.5 months, 4 months and 3 months. No correction was made for variation other benefits.

unmeasured characteristics, rather union power or "dualistic" discrimination; in any event compensation typically varies by 20% to 50%, with some cyclical fluctuation.[21] Note that this is *not* the case for *paato*; as Table 4-2 indicates, for them wages vary little with firm size.

A method of measuring such differences frequently used in Japan is to compare the wages of "standardized" workers by firm size, where standardized workers are male high school graduates employed in manufacturing who have been in the same firm since leaving school. In 1981, the wages of such workers in firms with 10-99 employees were 90% or more of those of workers in firms with over 1,000 employees through age 44, and somewhat more than large firm wages during ages 22-29; they were at their lowest at retirement age (55-59) but were still 82% of large firm wages.[22] In 1971, while the economy was still growing rapidly, the pattern was similar in the middle years, but wages actually averaged higher in smaller firms for the first 10 or so years, and were substantially lower for older workers. In 1961, with the economy at the start of the "rapid growth" era, wages were uniformly lower in smaller firms, ranging from 92-96% for ages 18-34, but falling to 80% or less thereafter.[23]

A similar story is seen in Table 4-4, which compares male wages by firm size without correcting for age or tenure. For the first 10 years of employment (tenure), wages barely diverge; it is only after substantial experience has accrued that wages begin to diverge. These differences are not trivial, but they suggest again that different types of workers must be utilized in order to obtain a different wage mix. Futhermore, as the differences in average wages are far greater than those for similar (for example, "standard") workers, the conclusion is that small firms are able to do this, by varying their labor force to a greater extent than large firms do.

Table 4-4 Male wages by age and firm size (all education levels and amounts of tenure), 1983. [Large Firms = 100]

| age | average | | production workers | | | white collar workers | | |
|---|---|---|---|---|---|---|---|---|
| | medium | small | medium | small | large (¥ 1,000) (= 100%) | medium | small | large (¥ 1,000) (= 100%) |
| 18-19 | 94% | 92% | 93% | 91% | ¥122 | 98 | 97 | ¥116 |
| 20-24 | 95 | 96 | 93 | 95 | 140 | 99 | 100 | 142 |
| 25-29 | 93 | 95 | 91 | 93 | 176 | 96 | 100 | 178 |
| 30-34 | 92 | 92 | 91 | 91 | 209 | 93 | 97 | 231 |
| 35-39 | 91 | 86 | 91 | 88 | 234 | 92 | 91 | 282 |
| 40-44 | 89 | 80 | 90 | 85 | 251 | 90 | 83 | 336 |
| 45-49 | 86 | 73 | 90 | 81 | 258 | 87 | 77 | 376 |
| 50-54 | 84 | 69 | 86 | 77 | 263 | 87 | 73 | 392 |
| 55-59 | 82 | 68 | 82 | 74 | 251 | 85 | 74 | 360 |
| all | 88 | 82 | 88 | 87 | ¥216 | 89 | 86 | ¥281 |

Notes: A large firm here is one with 1,000 or more employees; a medium-sized firm is one with 100-999 employees, and a small firm is one with 10-99 employees. The source is Table 6, pg. 20, Rodo Tokei Chosa Geppo 36:5 (May 1984) for indices, Table 4, p. 19 for wages.

Homogeneity in Firms: Case Study Evidence

Clearly a wide variety of types of workers at a substantial range of wages is available in the Japanese labor market. Empirically, however, this variety is not found within firms, but only between firms; there is specialization at the firm level in the type of worker employed. In order to "tap" a different type of labor, or a different regional labor market, firms turn to other firms via subcontracting.

The following case studies of three firms illustrate the very focused nature of the internal labor force in Japan. Other indicative data from standard statistical sources are presented in the subsequent subsection, but it is only at the firm level, and hence through case studies, that this specialization is readily apparent. These cases reported below are drawn from a sample of 30 firms which were visited during the course of the author's research in Japan. In part because of their intrinsic interest, and in part because they will be referred to in other parts of the author's Ph.D. dissertation, the firms are described at some length. They are also representative, in that for any of them another firm could have been substituted which had similar labor practices. In the case of Kakaa Tenka, for example, the published literature offers other examples.

The following material is based on interviews conducted by the author in 1984. For Kachikachi Corp., four days were spent interviewing management and visiting parent and affiliated plants; this has been supplemented by a variety of published and unpublished materials.[24] Kachikachi Corp is located in a city of 50,000 people several hours from Tokyo; it is a large manufacturing firm with a "permanently" employed labor force, white- and blue-collar, of 8,000. Kakaa Tenka is located near its parent firm, an affiliate of Kachikachi located in the same mountain district. Futsuka Yoi was visited once; in addition, other firms supplying the same parent firm, as well as the parent firm itself, were visited one or more times, and a firm history of the parent read. These firms were all located in the Yokohama area.

*Futsuka Yoi*

Futsuka Yoi Inc. is a supplier to a firm which in turn supplies truck bodies for a Tokyo-area truck factory; it is thus a second-tier subcontractor. This firm consists of the owner, one other skilled worker, and a dozen or so other workers. None of these workers are young, and most are downright unreliable, according to the owner. In fact, at the time, only 8 were present; one or two, the implication was, had drinking or health problems. There were three women working at a punch and two spot welders, where they were putting nuts on pieces of sheet metal that would go into a truck. None of the women appeared to be under 50; two men were distinctly elderly, appearing to be in their late 60's.

The owner noted, however, that he survived because he was able to manage such a work force, which not surprisingly did not command very good wages. He was involved in making very small, intermittent production run stampings, for specialized truck bodies that were sold in low quantities or (presumably) as replacement parts. Most of his facilities, in fact, consisted of dies owned by the "parent" company, stored neatly on racks for maintenance and ready access. He had only three medium-sized presses, two smaller ones, and the spot welders and punches; not all of them were in use at the time, both because his work flow was irregular -- he purposely maintained excess capacity -- and because it was not a good year for truck sales.

With his production neither regular nor high in volume, he did not need a regular labor force to staff a "line". He was also not out too much money if more people showed up than he needed on a given day. He could call those who had failed to show up, or one or two older workers who wanted only occasional work if he had a rush of orders. Since he worked only for one firm -- 100% of his business was for the larger truck body manufacturer -- he could work with them as their orders came in, to judge by what time his own items would be needed and thereby schedule the flow of his production.

It is hard to imagine such an operation in a larger firm; the manager of the department would have to have total discretion over hiring and firing, wages, scheduling -- in short, he would have to have authority to run it as if it was his own business, without need to adhere to company "policy". But if that were the case, there could be nothing gained by having it an "inside" operation, and it would be hard to gear incentives to have someone work as if it were theirs, without it actually being theirs. It would also be impossible to operate as anything but a small shop; labor management was intrinsically personal. The unit was that which could be comfortably managed (and, when need be, operated!) by one man.

*Kakaa Tenka*

Kakaa Tenka is located in a rural area, and operates as a subsidiary to a large precision equipment manufacturer. One of eleven similar companies, it assembles computer printers for the parent firm in an old school building. The most striking feature is that, outside of a handful of management and supervisory personnel, all the 200 workers are women. In fact, not only are they women, but all of them are married, and from the same village; the overwhelming majority are farmers' wives. Furthermore, they are all paato ("part-timers"), in that they work a 35 hour week consisting of five seven-hour weekdays, timed to mesh with the schedule of the local schools. All receive virtually the same wage, ¥600 per hour. The village social structure, in fact, made it very difficult for the company to do otherwise, and it had given up in an attempt to assign the better workers some authority; the ranking that resulted inevitably clashed with the social hierarchy of the village which governed their interactions during the remainder of the week.

Because of the "short" (35-hour) work-week, these women were not classified as full-time workers, and the firm was not legally required to provide a number of otherwise mandatory benefits. Given its size in the local labor market, it nevertheless felt it necessary to provide some benefits in order to hold turnover to a low level. Kakaa Tenka thus offered some vacation and sick time and small semi-annual bonuses, and its pay is higher than that of similar (but smaller) operations in the region. (They get by with as little as ¥550 an hour, and no benefits.) With its rural location and work schedule, Kakaa Tenka found itself a monopsonist, tapping a particularistic labor market, but its position was not very secure. Not only was it aware of its impact on the local labor market; automobiles were rendering the village less remote, and good paato women were in demand in the region. There is a long tradition in Japan of structuring assembly operations to take advantage of such localized labor pools, and the village was situated in a region with ready access to both Nagoya and Tokyo / Yokohama. The parent firm, in fact, foresaw the need for further expan-

sion, but was considering locating new facilities outside the region, despite a policy in the past of keeping all such operations near each other and the parent firm. Local labor was simply too expensive, relative to truly remote regions of Japan such as *Tohoku* (the Northeast provinces of Japan).

Such practices are far from unique. Ono and Odaka [1979], p. 121, documents the use of 20 subsidiary firms by the Yazaki Group, whose main product is automotive wire harnesses. For the labor intensive process of manufacture and assembly of bundles of wires, shops were set up in heavily populated areas with housewives employed for 3-4 hour shifts, with three different time slots permitting staffing for the full day in truly part-time work. Yazaki also maintained employment rolls of over 1.5 times current labor needs, to permit ready staffing; apparently no serious attempt was made to promote long-term employment. As with Kakaa, all managers were full-time males affiliated with the parent firm.

Yazaki also made heavy use of women in-house, but these women were hired after graduating from school and were not housewives. From 1973, however, Yazaki decided their employment had become "out of control" (for which one could undoubtedly read "too costly") and their numbers were cut back sharply through the simple expedient of not hiring more girls as the existing workforce got married and quit. The details of management thus differed slightly from Kakaa Tenka, both with a simpler product and urban locales, but the motivation remained the same.

*Kachikachi Corp.*

Kachikachi Corp. is a watch manufacturer with 8,000 employees, though it now has other products in which it does well in world markets. Its traditional product, purely mechanical, required precision manufacturing of the parts of the movement, assembly of the movement, and assembly of and insertion into the case. Twenty years ago, assembly was done solely by hand, but in the intervening two decades all of the steps have been automated, and most products moved to a production lines in which gears are inserted and near-invisible screws placed and torqued in by a series of similarly small machines. Only for certain low-volume movement sizes have lines not yet been built, and they are the only ones now assembled by hand; even "casing" has been largely automated.

Electronic watches are far simpler, but mechanical ones are still produced in significant numbers -- a projected 15 million from one of the firm's factories for 1984 -- for developing country markets where batteries are not readily available. The manufacture of most of the components of movements, the assembly of movements and "casing" are all done in-house.

(Some movements were sold on an OEM basis to unnamed foreign firms, which did their own casing.) In contrast, the manufacture of the cases and facing is done almost entirely by outside suppliers.

Other parts of the firm produce the quartz crystals and integrated circuits; wind the coils which are the other main element in electronic analog watches; and design and produce parts for electric shavers, floppy disk drives, printers and other computer products. (Assembly or other labor-intensive work on these products is generally subcontracted.) Despite this variety, the company has on the surface an extremely simple personnel system: there is only one pay scale, for white and blue collar alike, excluding the 80 managers of *kacho* or higher rank. Some people ascend further and more quickly than others, but in principle there is no tiering of workers; for example, title and compensation do not permit production and office workers to be distinguished. Most important, there is no leeway for the inclusion of a large group of "low-paid" employees for use in labor-intensive tasks. All outside of management are union members, and receive the union wage.

A number of loopholes exist, but the personnel manager noted that the union had negotiated for and won limits on their size. For example, *paato* (female) or "temporary" (male) workers were limited to 5% of union membership, with an informal agreement restricting them to unskilled jobs (such as material handlers) so they could not be turned into substitutes for regular employees. For many firms, employing women is a traditional way around rigid pay scales; most quit (or, depending on the firm, are fired) upon marriage or pregnancy. At Kachikachi, however, not only are women not fired, but very few of them quit. (This was *not* the case at an affiliate located 40 kilometers away. The explanation they provided was that theirs was an old [silk] manufacturing and farming area where it was accepted that women should work in factories, and that in any case they should work, while in the neighboring castle town factory work was looked down upon, and women would leave when the opportunity presented itself.) While on average women at Kachikachi Corp might not move up in the hierarchy as much as men, the age component of the firm's wage scale meant that they soon were far from inexpensive. (I discreetly did not inquire on whether there were any women in management, meeting only men in my interviews; most of the people I noticed working on production were women, including many of those tending or repairing machines.)

At Kachikachi, not surprisingly, very little purely labor-intensive work remained. The only important labor-intensive item was the watch case, and there (despite much effort) automation was limited. Kachikachi purchases these watch cases, their only important outside purchase other than raw

materials. And being labor intensive and readily and cheaply transported and inspected, the drive in case manufacturing was for inexpensive labor -- overseas. In the previous several years, 20% of case manufacturing had shifted abroad, principally to Taiwan, where a local industry was developing. Soon the cases for all but the most expensive watches will be procured from abroad. (Initially these firms were begun by local entrepeneurs in response to the export from Japan of the circuitry and display for inexpensive liquid crystal display watches, for which they provided cheap cases; there was no mention of their having originated as joint ventures. Kachikachi did not apparently manufacture these components -- they probably were supplied by calculator manufacturers, a business line which Kachikachi had unsuccessfully attempted to enter.)

At Kachikachi, then, the product has come to reflect the labor force: design, precision component manufacturing, and largely automated assembly tended by experienced women. It has proven easier to contract out, to purchase services and components which require other types of labor, than to try to adapt the personnel and management system to cope with human diversity. Firms such as Futsuka Yoi and Kakaa Tenka exist to meet such needs, offering the management of their own, particularistic, labor forces.

## Homogeneity: Statistical Evidence

Evidence has now been provided of the wide range in wages faced available to employers in Japan. Here age-specific wages by firm size and average wages by firm size will be analyzed as another source of evidence of specialization at the firm level (homogeneity within the firm) in the utilization of labor. It was noted that larger firms pay more than smaller firms for "similar" workers. This suggests that large firms are either constrained to pay more, or systematically hire (specialize) in workers whom the market evaluates as deserving a higher wage, using information to screen employees in addition to that reflected in the standard statistical sources.[25] Second, and more important for the argument herein, the difference is even greater when average labor costs in smaller and larger firms are compared. In other words, not only do smaller firms pay less for workers of the same sex, age, educational level and tenure (the crude "observables" of labor force surveys, which nevertheless explain much of the variation in earnings),[26] but they also systematically use types of labor not utilized by larger firms, such as "part-time" female labor. Furthermore, the case study evidence suggests that small firms as well as large firms specialize in specific types of labor; the difference is in the portion of the labor market in which they specialize.

For example, 1981 average compensation in manufacturing for firms with 20-99 employees was 63.3% of that in firms with 300 or

more employees, and 57.9% that of firms with 1,000 or more employees. Similarly, for incorporated firms, labor costs in those with a capitalization of ¥10-50 million is 58.2% that of firms with a capitalization of ¥1 billion or more. On the other hand, labor costs comprise 78% of value added in smaller firms, as opposed to 60% in large firms.[27]

In more detail, drawing from the Japanese Census of Manufacturers (Kogyo Tokei Hyo), in 1981 total annual wages in manufacturing ranged from ¥4.06 million[28] for workers in firms with 1,000 or more employees, to 2.78 million (74.7%) in firms with 100-299 workers, and ¥1.78 million (47.9%) for workers in firms with less than 10 employees. Similarly, labor force statistics for 1981 show wages in manufacturing firms with 500 or more employees at ¥3.33 million, in firms with 100-499 employees at ¥2.61 million (80.0%) and in firms with 5-29 employees at ¥1.87 million (56.3%).[29] The key observation here is that this variation in average wages is greater than that by firm size for (statistically) comparable workers. The composition of small and large firm employees systematically differs.

Thus, for example, smaller firms employ more women. In firms with 500 or more employees, women comprise on average 22% of employees, and the proportion has declined over the last 10 years. Women, on the other hand, comprise a little over 35% of the workers in firms with 100-499 employees, and 40% in firms with fewer than 100 employees.[30] Similarly, the average age of workers in firms with 1,000 or more employees was 36.9 years in 1981, while that in firms with 10-99 employees was 40.7 years; while this would suggest higher costs, other things being equal, virtually all post-retirement-age workers are in smaller firms, at wages substantially below those a few years their juniors.[31] Finally, and this is reflected in the average level of education of workers, smaller firms have on average more production and fewer technical and white-collar workers; in firms with 10-99 employees, 71.2% are production workers, while only 54.1% are in firms with 1,000 or more employees.[32]

This differential in wages with firm size is found in the automotive industry as well. The Japanese Census of Manufactures presents data on employment and total wages by firm size, from which average wages by firm size can be calculated. In the Census, the automotive industry is represented by four classifications, the automotive industry (at the 3-digit level) and automotive assembly, truck and special-purpose vehicle bodies (*shatai kogyo*) and automotive parts at the 4-digit level. Table 4-5 presents comprehensive data for 1983, while Table 4-6 presents comparative data for selected years. Independently, Odaka [1984] also reports that for the transport equipment manufacturing industry (a broader classification) the wages of workers in firms with 1,000+ employees, relative to those in firms with 10-99 employees, declined steadily from 170% of

smaller firm wages in 1957 to 130% in 1967, before increasing gradually to 140% in 1976 (Figure 4-1).[33]

Much as in industry as a whole, average wages vary by a factor of two, far more than the variation in wages for similar individuals (such as the "standard" workers) discussed above; the ability to use a different mix of workers surpasses the effect of "dualistic" wages. Given the greater share of labor costs in parts manufacturers, this differential is particularly important.

Unfortunately the Census does not provide data on the sex or age distribution of employees, but the case study data based on on-site interviews again indicates that, as this data suggests, the type of employees in smaller firms is systematically different from that in the automotive firms proper and their larger suppliers. Further details are presented by the author in his dissertation, utilizing a variety of *ad hoc* Japanese-language studies of the automotive parts industry and other case study data. Below the sources of homogeneity will be examined, which will provide further examples of and some qualification on the extent of this homogeneity.

## Section IV. Sources of Homogeneity

### Introduction

Granted that firms in Japan employ homogeneous labor, one still needs to ask why should one have this firm-level specialization in the types of labor which are utilized, coupled with subcontracting? Why not have a tiering of workers, paid as deemed appropriate by the market, given their observable characteristics, yet grouped within the same enterprise?[34] Indeed, such practices could to a certain extent be observed in Japan during the late 1950's and early 1960's.

The task of this section, then, is first to develop a set of reasons why homogeneity is a constraint, rather than a choice from several feasible compensation / labor relations patterns. Of these, the development and characteristics of Japanese labor relations will be examined in the greatest detail. Second, in the process of doing this, further evidence for homogeneity will be given, as well as details and qualifications on the strength of the constraints in using varied types of labor within a single firm, and how they have evolved over time. The section will be summarized by again returning to the issue of subcontracting, whether "the" labor relations framework was a significant causal factor in the relatively heavy use of subcontractors.

A list of factors leading to relative homogeneity can be readily drawn up. First, there is ideology and social norms affecting what are considered appropriate social distinctions. This can involve, for example, the relative weight given to "egalitarian" ideals. These facets will be amplified briefly in what follows. Second, and the element examined in the greatest detail below, is "the" Japanese employment system, a pattern for systematizing labor relations that is widely accepted as normative and positive by both employers and employees. This system will be detailed, and its evolution over time and the leeway provided for individual firms to mold it to permit the tapping of disparate parts of the labor pool discussed.

Underlying the above, but not directly addressed herein, are that a group of relatively similar workers may be easier to manage, both for the "bureaucracy" of a large firm and for the entrepeneur in a small subcontractor. One set of work rules, one set of wages can be utilized; cross-worker and longitudinal ("panel data") comparisons and hence information on individual effort and work quality are easier to compile and more meaningful than when workers are more variegated. Social conflicts and other barriers to smooth operations can be overcome more easily. On the other hand, jointness in production, the presence of "teams" and difficulties in monitoring behavior mean that it is difficult in many cases to make pay disctinctions among workers on the

basis of their "contribution" in a way which will viewed as fair. Furthermore, assignment to "important" or "productive" jobs may be viewed as more the outcome of a lottery than a recognition of superior ability -- and even where ability is slightly better, there may be hard feelings if that leads to much higher pay. Rather than making arbitrary disctinctions, it is better to pay the same wage for the same type of worker. (In the US, the focus is on equal pay for equivalent "jobs" rather than "persons", though in practice the two criteria may not differ much.)

Sociology and Ideology

Ideals and social norms in Japan contribute to an emphasis on homogeneity within the workplace. There is a large sociology literature on the group orientation of Japanese society and on "vertical" relationships. While the author is not current with this literature, older works such as Nakane [1970], Vogel [1971], Cole [1971, 1979] and Rohlen [1974] detail both the concern with keeping a group harmonious, and with distinctions other than income relating to status. Equally important, a prerequisite for maintaining group cohesiveness is that members be similar in age, firm membership and other personal characteristics. When a firm desires to give an individual superior status as a manager, or to otherwise provide an incentive or reward for performance, it is possible (and necessary) to do this through more than compensation alone, and it may even be feasible to do this without making distinctions in compensation. The other side of the coin is that a relatively small differential in compensation can be viewed as setting someone apart and hence destroy their status as a "peer". (In contrast, compensation may be viewed as a better and more appropriate signal in the U.S.; a boss must be paid a substantial differential to be viewed as a boss, or a large difference in compensation must be offered as part of a package of incentives for them to be effective or credible.).[35]

Firms are also embedded in local society, an important aspect when location is rural. This was one point stressed by the management of Kakaa Tenka, reported above. Where "peer" and "superior" are determined by factors external to the firm or to an individual's skill and effort, as was the case there, then the only feasible policy can be to make no distinctions among individuals in the workplace. Finally, there are attitudes that an egalitarian ideal should be given substantial weight, at least in post-World War II Japan. Furthermore, this is likely to be reflected in industrial relations. To conclude this subsection, the case of Kachikachi Corp. will be further detailed, and will be followed by quotes presenting a management perspective on egalitarianism.

At Kachikachi Corp, the head of personnel could claim that all regular employees in his firm were on a single pay scale. The exception he noted was the 80 employees in upper-middle and

higher management. When pressed, however, he noted two further exceptions. One of these was temporary workers, who through agreement with the union were restricted to 5% of total regular employees (or, equivalently, union membership) and to jobs without a skill component, such as material handlers. As would be the case with *paato* (which they may formally have been), such workers were paid far less than career-track employees. The other of exception was a small group of employees with specific, licensed skills, such as the boilermen who operated the heating plant; such workers again accounted for no more than 5% of all employees. They were paid according to the level appropriate to their craft, which in some cases was considerably more than a career-track worker of comparable age would receive. Note that on paper there was no differentiation among employees in blue- and white-collar jobs. A college graduate enters four years older than high-school (generally "blue-collar") workers, but given an age component to wages, they receive the same compensation as equal-aged high-school graduates. Parity is maintained for roughly 10 years, nor do bonuses vary by more than two per cent among a "cohort". Large differentials in compensation do not appear until nearly 20 years have passed, or at age 40 -- the age when promotions into middle management commence.

In short, at this manufacturer, management has agreed to a relatively undifferentiated wage structure. In turn, the firm carries out only a certain range of operations, subcontracting specific, labor-intensive processes to other firms which specialize in lower-wage labor -- including, recently, firms in Taiwan and other parts of Southeast Asia. The "parent" firm here carries out design work, manufactures the tooling for movements, makes most of the movement, and carries out final assembly; it purchases the case, facing and hands.

Compared to the US, this is a highly egalitarian system, and is viewed as such by Japanese as well. Ryushi Iwata [1982], in a book aimed at Japanese managers, discusses these employment practices as a "system", which has spread to the point that it is very difficult to change, or, at the individual firm level, go against.[36] He devotes an entire section of his book to the "Egalitarian Mentality", and while he notes that "it is still not clear as to exactly how this egalitarianism came to strike roots in Japanese organizations" (p. 60), it is now firmly established. Hence,

> In many Japanese companies, during the first ten years or so of one's career with the company, individual wage differentials (between those members with the same number of career years) are seldom introduced even if performance evaluations are conducted. In the years that follow, slight differentials are introduced but they are, in fact, very minimal. Moreover, since a variety of allowances and fringe benefits are added to one's salary (depending on family structure and type of

work), it is very difficult to tell who is evaluated higher unless you find a way to compare *only* the basic pay. So, when you reach a managerial post, especially the level of section manager (which, in a typical Japanese company, can take about 20 years), you finally begin to recognize slight individual differences in the number of years it took to reach the same level or in the prestige of the title that is granted. Only then do you get even a vague idea of where you are in the promotion race. Very slight differentials that would function as an incentive in American and European organizations play a crucial role in Japanese companies.

That is because even the slightest gap eventually ends up being significant, even decisive, in Japanese companies where a permanent relationship is one of the essential factors. In addition, the unique concepts of egalitarianism, capabilities and status awareness that make the Japanese highly sensitive about their status within the organization help these slight differentials to function even more effectively as incentives. Because of this, the Japanese system of age-grade pay, which at one time was criticized as being a disincentive for workers, has actually been arousing very keen competition for promotion in Japanese organizations. And, because the differentials are so small, more members stay in the race for longer periods of time, thus helping the organization to maintain its dynamism. It also offers an economical, low-cost system for Japanese-style management.[37]

Similarly, a journalist commenting on Honda Motors states:

In a maternal society like Japan, most people are strongly group-oriented, and tend to believe that everyone within a given group must be equal. These factors caused labor unions to resent the evaluation of individual members. And management also had to respect such sentiments on the part of the unions, for they were seeking to make this egalitarianism the basis for good labor-management relations, by avoiding large wage disparities among the employees.[38]

Many other quotes and anecdotes could be given to indicate that this is widely viewed as a constraint. The above attitudes and union pressures are items which contemporary managers must take into account, and which encourage the selection of a homogeneous subgroup of workers from the labor pool of the economy. To reiterate, these serve as pressures upon firms to specialize in specific types of labor, with the stricture truer for large than for small firms.[39] In turn, subcontracting provides a way to get around this constraint.

## "Lifetime" Employment and Homogeneity

### The Argument and the Stereotype

While the above is symptomatic that management views the current pattern of labor relations as imposing constraints on their decisions, rhetoric and reality seldom are identical. How accurate is the stereotype of Japanese labor relations? To the extent that it is more myth than reality, then the argument that "the" employment system imposes a constraint on firms will not be supported. (And to the extent that "the" employment system is significant in driving firms to subcontract on the margin, then, *ceteris paribus*, the chronology of its development should coincide roughly with increasing use of subcontracting. This test will not be performed here.)

The following therefore analyzes the large firm labor relations system, asking whether it really is rigid, and how important "temporary" employees and others exempted from the system have been in large firm employment. To do this, the standard stereotype of the labor relations system is set up as a model, and an overview is presented of when this "stereotypical" system came into existence and how it has changed over time. The analysis focuses on the automotive industry, asking when the system developed, how strictly the labor relations system depicted in the stereotype applies in the industry, and how important the *caveats* are (that is, have automotive firms have been free to utilize women and "temporary" workers). Unfortunately the author does not know of any similar data permitting an examination of the evolution of labor relations in smaller firms.

Briefly, the stereotype of Japanese labor relations is one of (1) lifetime employment, (2) compensation based primarily upon seniority and secondarily upon (seniority-correlated) status, rather than upon the current "job" and (3) hiring only of new graduates. Lifetime employment means that, once hired, a regular worker will not be fired or laid off until retirement (long at age 55, but currently shifting toward age 60). Seniority wages mean that similarly aged workers will be paid similar wages, rather than the wage being a function of the current "job". Hiring only new graduates implies that interfirm mobility is limited, so that the internal wage ladder is specified more by the firm than taken from the market. Finally, the qualification is appended that this applies primarily to regular employees of large firms and the government.[40]

While formally applying only to the 1/4 of the labor force which falls under the above classifications, the author's observation is that many smaller firms view these practices as normative, or hold them up as an ideal towards which they strive, but which they unfortunately cannot attain. Kakaa Tenka, for exam-

ple, explicitly aims at "lifetime" employment which, however, means they avoid new graduates who experience shows will soon leave for marriage and family; they experimented with but largely eliminated age and status pay differentials. Furthermore, while the system is commonly viewed as applying only to males, this is because women in general exit the labor force several years after leaving school, so that they effectively drop out of the system. In many firms women are offered the same options as men on paper; in few firms do they in fact continue to work after marriage, which is one unusual aspect of Kachikachi Corp. described above.

The key point is that (large) firms are limited in making horizontal pay distinctions among workers of the same age, while the only inexpensive workers under a seniority-based compensation system are young workers and lifetime employment means that young workers (quits aside) inevitably become older workers, so that average wages are only low when a firm is growing (or recently grew) rapidly. To the extent that markets function well for labor, one implication is that different skills will be compensated differently; absent an ability to make horizontal pay distinctions, the stereotypical firm will tend to specialize in one segment of the labor market or it will have a wage ladder which will tend to over-pay substantial numbers of workers, relative to the market evaluation.

## Development of the Stereotype Pattern

The most detailed study of the evolution of labor relations is Gordon [1985]; he traces the development of industrial relations from the perspectives of both management and labor for heavy industry in the Tokyo - Yokohama - Kawasaki area, the region where several of the major automotive firms are located, from the 1800's into the mid-1950's. A main theme of his book is that "the" Japanese employment system is not something that existed, except as one of several patterns, until the 1950's; Odaka [1984] bears this out as well. Seniority wages, single port-of-entry, "lifetime" employment -- these were only concepts, not practices, prior to that time.[41]

Gordon observed that in manufacturing workers were initially organized on the basis of crafts, but in contrast to the Europe and the US, there had never been nation-wide organizations which could restrict craft entry in Japan (which should not surprising, given the pre-1868 [Tokugawa] political structure). In the early years of the metal-working industries, the typical skilled worker was a "traveler" who wandered among various large shops, often in different parts of the country, as well as periodically running his own small shop. If successful, he might even become an *oyakata*, a labor boss / foreman, organizing the workers for a large factory in a manner reminiscent of American "straw bosses" or inside contractors.[42]

As firms sought a more stable labor force (in line with a desire to keep the more expensive equipment they were installing effectively utilized), and as technology diverged further and more rapidly from the traditional craft base from which skilled workers had been drawn (and hence firms needed to train workers, often in the use of equipment not found elsewhere), firms tried to intervene directly in the management of their labor force.[43] However, wages were still those of the craft to which workers belonged (reflecting skill-*cum*-experience/age), and the bulk of workers continued to have experience at several firms, as well as in many cases running their own small shop for a while: they neither viewed employment as "lifetime", nor were firms successful in keeping the labor force stable -- even when they were given legal backing to do so during World War II (Cohen [1949]). White collar workers and "management" tended to be employed under a different system, which provided a model for postwar developments; Fruin [1978, 1983] provides case studies of such workers at Kikkoman, and the example of traditional merchants (e.g., Mitsui) is also often cited. They were not, however, representative of most workers.[44]

As Gordon aptly summarizes, before the end of the 1950's observers of Japanese labor practices would not have found the elements which today most Japanese and Westerners assume to represent "traditional" practice. It was only with the rapid spread of unions immediately after the war, which was encouraged by MacArthur, and the pressure through the mid-1950's (until 1954 in the auto industry, for example[45]) of a militant labor movement that the prewar white-collar model began to be applied to the bulk of employees in large-scale enterprises. One feature of the militancy was also an emphasis on egalitarian ideals, such that there soon ceased to be separate white- and blue-collar unions in the same enterprise.

Other features were a rejection by labor of output-linked compensation, and widespread demands for a "living wage" as the prime component of base pay. The immediate postwar hyperinflation and the use of payments based on family size and other such "livelihood" criteria during World War II (seized upon as a means to avoid wage controls) fueled these demands. The prototypical example here was the "Densan" wage pattern, reflecting the wage system adopted in the electric utilities in April 1947 as the settlement of a strike the previous winter. To calculate an appropriate "living wage", under the "Densan" pattern a cost-of-living table was drawn up, based on age, marital status and number of children; this in practice worked out to be a "seniority" wage. The "Densan" model was soon widely imitated, and continued to be influential at least into the 1970's. (Miyashita [1971], a handbook on setting up compensation schemes for small businesses shows how to calculate the wage needed to provide a "standard" living for a given age and family size, based on econometric estimates of the elasticity of expenditure by these criteria.)

The recessions following the end of the Korean War led to attempts by large firms to pare employment ("rationalize") led to bitter strikes, and immediately thereafter these firms resisted increasing the size of their unionized labor force; hiring patterns, "lifetime" employment and the wage pattern were now all widely recognized, so that contemporary Japanese observers could speak of "the" Japanese employment system described by Abegglen in his 1958 book, The Japanese Factory. This legacy is important, because from the 1960's virtually all firms with 300 or more employees have had unions, whether formal or *de facto*. By law firms are required to have a consultative mechanism, and academic observers of the labor market such as Profs. Koike and Shimada claim that these are active and important. (Where formal labor contracts exist, they stress consultation rather than impose detailed rules and contingencies.)[46]

For the automotive industry, one sign of the development in the 1950's of unionized, internal labor markets can be found in the *Chingin Jittai Chosa* (currently *Chingin Kozo Kihon Tokei Chosa*, or the Wage Census), which began in 1954 with a survey of over 2 million employees in different industries (out of a sample universe of 6.5 million workers).[47] Contrary to the homogeneous seniority-wage model, in the 1954 survey manufacturing wages are classified by detailed craft criteria. In the transport equipment industry, the breakdown is by over 42 different trades, giving age, tenure, wage, education, sex and other data. Not only are job classifications quite detailed, but in addition for several large classes (lathe operators, press operators, sheet metal workers and assemblers) data was not on tenure but on experience: the market was clearly viewed as an interfirm one, and one where many apparently chose to work in smaller shops without a substantial difference in their wages. The organization of these surveys shifted thereafter quite rapidly, so that by 1964 there were fewer classifications, and of the 30 reported in the Wage Census, 10 were now for management and only 20 were for trades -- and several of the latter were specifically subindustry classifications. By the 1974 survey, only three craft classes remained. Furthermore, by the 1970's "the" permanent employment system was clearly held as the starting point for smaller firms in devising their own wage systems.[48]

To give an automotive example, Honda formalized its "basic system" in 1953, five years after its establishment. Along with (apparently) seniority elements, it also incorporated 52 job categories, a number similar to that used in the Wage Census, although Honda was at that time producing only motorbikes and motorcycles. The weight of these job categories is now small; by 1974, when the source of the above was written, "job pay" accounted for less than 5% of base pay. What differentials existed were a function of a "ranking" (seniority-linked promotion) system, where in principle there is no variation in pay for workers the first tier, and only +/- 3% until an employee is in his late 20's.[49] Similarly, Kato Shatai Kogyo, a truck body

manufacturer, moved away from a craft / apprentice system in 1953 when workers formed a union and went on strike in one of its two plants, and it installed a "modern" employment system over the next decade.[50]

In sum, prior to the 1950's the importance of internal labor markets was much smaller in Japanese firms, and wages are thus those of the external market. By the start of the 1950's, with the rise of post-World War II unionism, this was shifting, and by the end of the 1950's there was a clear perception of there being a "Japanese" system resembling the stereotype discussed above.

Strictness of the Pattern

Few if any firms ever had a compensation system based solely upon seniority. For example, the "Densan" wage settlement itself was soon modified due to difficulties in implementing it: too many workers had to be "grandfathered" and paid under older norms, resulting in an unwieldy and strife-ridden wage structure. (Younger and faster growing industries may have faced fewer problems.) Seniority continued to be stressed, and the institution of regular wage increases ultimately reinforced this. Nevertheless ranks (seniority-linked pay / promotion ratings) were again introduced in the early 1960's, so that "ability" pay increased from an average initially of 21% of compensation in the mid-1950's to 33% on average by 1962. In general, these changes became more important only in the late 1950's and early 1960's; for example, steel introduced a job classification system in 1962.[51] Hence a mid-1960's a survey of employees' views of the wage structure of firms found that only 9% of the large firms used the stereotypical *nenko* seniority system, although 49% used it as their single most important criterion. (On the other hand, 9% based their compensation solely on job and ability and a further 33% used job and ability as their primary criteria, while also taking into account seniority.)[52]

For the automotive industry, Honda initially had what seems to have been a market-oriented classification, as noted above, but it must be remembered that in 1953 Honda had only been in operation for five years, and was as yet but one of a host of motorcycle producers in Hamamatsu, the center for that industry. During 1960-65 Honda grew 9-fold, while production shifted from a reliance on skilled labor (which was in scarce supply) to the use of semi-automated machine tools and other less skill-intensive equipment; in this it was similar to the automotive industry as a whole. Job classification seems to have became relatively unimportant as a determinant of pay at Honda by this period; something resembling the "seniority" system was in operation.

A major shift had however again occurred by 1970, as Honda began to place greater emphasis on ability and performance. The

new norm was formalized in 1972, with the setting of criteria and evaluation procedures which involved feedback to and from the employee involved (and lessened the influence of the immediate supervisor).[53] Pay scales were also revised and publicized; ability was linked to promotions, and performance to bonuses and yearly pay increments. Noticeable in this are two shifts in the age-wage gradient. First of all, it had become flatter; in 1962, pay at retirement was 4.2 times that of a 20 year-old worker, while by 1973 it had narrowed to 2.5 times that of a young worker. (See Figure 4-2, illustrating a similar narrowing for Daihatsu.) Second of all, in 1962 pay peaked at retirement, while by 1973 it peaked at age 40, a typical large-firm pattern. More important for my purposes, the compensation system included explicit bounds on deviations from the "model" wage for the average employee. For the first two ranks, promotion was virtually automatic, hinging solely on tenure, while the deviation by age 27 (as noted above) was +/- 3%; ability and performance were rewarded only later in one's career.[54] Similar changes occurred at the other automotive firms, in studies described in the endnotes.[55]

In sum, the above suggests a gradual evolution in the details of practice (not all of which are detailed above), which include at present, relative to the stereotype, (1) explicit tracking (e.g., blue-collar vs. technical workers) and use of ability as an explicit component of compensation, (2) a ceiling on the seniority component of pay increases of age 40, rather than a continuation until retirement,[56] and (3) a transition to an age-wage gradient which is far less steep than that of the 1950's. Nevertheless, a firm's flexibility in compensation for the first two decades of employment for those who fall under this wage system is still very restricted; divergence among different workers only begins after a decade of tenure, and at a relatively high average age and hence already high pay level.

## Exceptions from the Large-firm Internal Wage System

The above has presented an overview of the well-known rigidity of the wage system for the "regular" employees of large firms. To what extent can large firms exempt employees from this system, so that flexibility can be obtained (or, in this context, disparate parts of the labor force tapped without sub-contracting). Two avenues seem open to large firms to increase their flexibility, namely to utilize female employees who will quit before they become expensive, and to employ workers (such as *paato* and seasonal workers) who are outside of the union and "the" lifetime employment system.

First of all, women are not, and have not been, a substantial part of the work force of large firms in the automotive industry.[57] To give two examples, in 1962 less than

8% of Toyota's employees were female, and most of these were clerical; less than 3% of factory workers were women. Similarly, in 1965 Toyo Kogyo employed only 983 women, less than 6% of its employees, and only 82 women worked in factories.[58] The same holds true now for the auto firms proper; women and *paato* are still a relatively small component of their labor force. (It is certainly *not* the case for parts suppliers, especially on average for the smaller firms.)

Second, and much more important numerically, were non-regular employees, of whom the largest group consisted of *rinjiko*, literally "temporary" workers. (Some firms also had "semi-regular" employees, consisting of new school grads in their first (probationary) year, and "re-employed" workers, those who have reached mandatory (historically age 55) retirement but have been re-hired under one-year contract.) Part of those labeled seasonal workers were truly so, moving to automotive and other factories as a form of by-employment during the slack part of the agricultural season; Kamata [1982] supplies a vivid first-hand account of the life of such workers. Most however were full-time employees without either the security of tenure or the pay that accrued to "regular" employees.

The standard (Marxist) interpretation of such workers is that they provided a buffer to protect the tenure of regular employees to recurrent economic crises; when orders declined they were fired. Another view, discussed below, held at that time was that such workers provided a way to circumvent the union wage structure and to weaken union power. It is important to note that "temporary" workers (and the same is true for women and *paato*, as the case studies above and those to be presented elsewhere in the dissertation suggest) are quite different in smaller firms: they are more likely to be long-term employees used as a buffer, or whom the firm deems as inappropriate to be made "regular" employees, with wages below that of equivalent "regular" employees.

In the pre-war period various categories of non-regular employees were a typical feature of large manufacturing firms, but in the post-World War II economic collapse most such workers were dismissed, and hence were initially numerically unimportant. In the automotive industry they first reappeared at Isuzu in 1950, with the boom in orders during the Korean War, and comprised 11.7% of the labor force around 1952 at the (then) "big three" automotive firms (Isuzu, Nissan and Toyota). Union pressure reputedly resulted in a smaller number of such workers in the mid-1950's at Nissan (e.g., 7.3% in 1956) but the number increased to 44% of total employment in 1963, dropping sharply immediately thereafter; the same was true at Toyota, with 1961 the peak. In 1967, such temporary workers constituted 9.3% of the work force, and while the proportion increased to 11% in the 1972 expansion, it has fallen to 7% or less in the 1980's.[59]

However, the drop in temporary employees at Nissan also coincided with the institution of a system in 1964 for "temporary" to become "regular" workers. Apparently a large proportion went on to do so, as such workers declined from 44% of the workforce in 1963 to under 10% in 1967.[60] The was a similar sharp reduction in temporary workers at Toyota. This suggests that in general for heavy industry before 1974 temporary workers either have gone on, through perhaps one or two stages, to become "regular" employees, or have left within a year, at either their own or their employer's instigation. This was a formal part of policy in some firms, and unions often pushed for rules regarding the transition of such employees to tenured status. The tremendous increase of output and the consequent demand for employees from the late 1950s through into the late 1960s simply outstripped the ability of firms to increase employment solely through new school leavers. Middle-aged workers, unlike new grads, would start out as "temporary" workers; with the continuation of the rapid growth of the early 1960's, such workers were able to gain "regular" status.

Women, then, have never been a significant part of the labor force in large firms, and hence have not provided a means of circumventing the wage system. Temporary workers of one or another category appear to have been important in the late 1950's and early 1960's; it is not clear how much flexibility this added in terms of wages. By 1965, temporary workers were in large part those in the process of becoming regular employees; while adding a transitory element which would lower average wages, they were soon to be integrated into the regular wage scale at higher levels, and even without this transition, the average compensation of temporary workers proper increased by 60% from 1959 to 1963. While there was a 3:1 differential in the pay of temporary employees to regular employees in 1959, this had shrunk to 2:1 by 1963 and as noted above the age-wage gradient was 4:1, so this would not seem out of line with what those joining the firm directly after school would receive.[61] While "temporary" workers were paid less than a worker with comparable experience, such status was not permanent, and conversion tables for Isuzu imply that outside experience and age were after this transitional period reflected in compensation.[62]

Summary

In sum, the permanent employment system itself has remained relatively inflexible since its development in the early 1950's, while women have not been an important as a source of flexibility. Temporary workers were an important exception only to the extent that they were *permanent* "temporary" workers -- while confusing terminology, *not* an unknown employment status in Japan. This was however not the norm in large firms in the automotive industry. Temporary workers were an issue with unions from the start, and as at Kachikachi Corp their numbers are now normally kept to low levels. Interviews with union leaders indicate that

is some interfirm variation. While at Nissan such employees are less than 5% of the labor force, the figure is a much higher 10% at Honda, and all such workers are in the factories, so that (with 1/2 of all workers "blue-collar") roughly 20% of Honda's factory workers are "temporary".[63] But this was again not the norm, and to the extent that there have been deviations, they were greatest in the early 1960s. As discussed elsewhere in the dissertation, by this time the subcontracting system was already in place. As one observer phrased it:

> Now from around this time [1955], in order to supplement their work force, firms began to implement policies of systematically and strategically utilizing "temporary" workers in parallel to the use of subcontractors".[64]

**Section V.**

Here several issues are raised which, while important, are beyond the purview of this paper. The three principal ones are the role of entrepeneurs, potential gains from subcontracting other than a more efficient utilization of labor resources, and seeming parallels and differences between the US and Japan as they relate to subcontracting and labor utilization. The final paragraphs address the representativeness of the automotive industry, and other possible tests of the homogeneity hypothesis.

The demand for subcontractors implied by this paper suggests an important role for entrepeneurs. On the one hand, entrepeneurial activity is needed to seek out and organize an appropriate supply of labor. On the one hand, entrepeneurs are needed to undertake process (or product) innovations which make it feasible to use a different type of labor force than that present in large firms. This latter process can occur as a result of ongoing R&D, both internal and external to the large firm. The former requires individuals willing and able to establish and operate subcontracting enterprises. In Japan there has been a large supply of such individuals; relative to the US, small-scale manufacturing is very prevalent (one of the observations which motivated this study), and those working or growing up in such small firms have been predominant in setting up new ventures. Data from Japan suggests that experience in small business is the best educator and motivator for future small businessmen; it is important in ultimate success.[65] If this is true for the US as well, then the relative poverty in the US of individuals steeped in small-scale manufacturing enterprise may mean that, due to supply-side factors, it will be difficult for firms in the US to shift to a more intensive use of outside suppliers.
[61]

The author can attest to many in Japan who have done well for themselves as owner-managers of subcontractors. Their numbers appear large relative to those who have advanced into the higher pay of top management in the auto firms proper. (In addition to income, surveys of small business indicate independence is a also strong motive.) Nevertheless, if an entrepeneur must compete with numbers of equally clever entrepeneurs, rents from innovations and from the tapping of geographically isolated or other particularistic labor markets can be competed away, to accrue to the purchaser of the (final) good. But since the entrepeneur in the short run is likely to be able to earn rents from innovation, a powerful incentive is provided for technical change. Other parts of this dissertation examine mechanisms to encourage such innovation, not only internal to suppliers but also when it involves design changes or other coordination with the purchaser. An area for future research, then, is whether subcontracting serves to improve efficiency over time through innovation, as well as to improve static resource allocation as argued in above.

Next, do American labor markets differ from those in Japan in terms of homogeneity? Subcontracting is less prevalent in the US; if the analysis of Japanese labor markets is correct, as well as its implications for subcontracting, then a natural question is whether this is due to differences in labor markets. Have the differentials in compensation among those who are viewed as different in the labor market been smaller in the US, or have the internal labor markets of large firms been less rigid? Or are alternative explanations, such as a deleterious impact of the long-enduring oligopoly in the American automotive industry (aided by the UAW's success in imposing uniform wages across firms) more important?

At present in the US, the minimum wage is $3.35, so that an employer's cost may be $4 per hour, while UAW wages, including benefits, are over $20 per hour, five times greater. This would make one wonder at the extensive in-house manufacturing of parts in Detroit, but two other elements intrude. In the US automotive industry there is the presence of an industrial union, which imposes very nearly identical wages upon firms, even though they may be in different parts of the country. Unionization also extends beyond the Big Three to include major suppliers, though not all are UAW shops; smaller firms in the US, however, are typically not unionized -- while virtually all firms in Japan with 300 or more employees have a union, as do many which are smaller.

In any case, in neither the US nor in Japan have unions been willing to tolerate much tiering on a wide scale within (respectively) the industry or enterprise; the quote which concludes this paper reflects current American experince. In the US (as well as in Japan) the process of unionization led to a substantial simplification of job categories and pay scales, as "objective" criteria came to dominate subjective ones, and as salaries came to dominate performance (output) compensation.[66] Rigidity of internal labor markets may be a common feature among large firms everywhere, and preclude variation in labor costs. This would suggest that subcontracting is in general beneficial.

It it is also conceivable that the range of wages in Japan is exceptional. This clearly calls for comparative study; as a start, Sterling [1984] suggests that Japanese and American labor markets are broadly similar. On the other hand, Table 4-7, following up on a suggestion made to the author by Prof. Banri Asanuma, indicates that the current high level of relative wages of the UAW is a comparatively recent phenomenon, beginning in the early 1970's. Since this data does not include benefits, which built up rapidly in the 1970's, it undoubtedly understates this trend. The greater US differential may thus be a product of the indexing of UAW wages during a decade of high inflation. If this is so, then the failure to subcontract may in the past have been less costly -- but is not the case now.[67]

Next, it is important to note that the Japanese auto industry is not "representative" of all of Japanese manufacturing, though it is as a minimum important in its own right. Variations from the practices in other industries are more in subcontracting than in labor. Alternative practices are found in industries such as shipbuilding and construction, where orders are discontinuous. Here the large firm operates more as the general contractor, hiring in specialized contractors. Steel also uses "in-house" subcontractors, who work alongside regular steelworkers in the mills. Such inside subcontractors are far less prevalent in the auto industry, though they are found in truck body manufacture. Since this paper does not detail subcontracting ties, neither is it appropriate to detail interindustry differences in practices. But to give one example, in the automotive industry there is a greater durability and closeness of ties, in part due to longer production runs and (to date!) more stable demand.[68]
FOOTNOTE: ref ASANUMA [1986] <==

Finally, are there other tests of the importance of homogeneity for subcontracting? As noted above, most theories in the literature are arguments for the desirability of vertical integration, and hence are not relevant. Alternative explanations, such as that subcontracting is strictly for incentive reasons, or to spread risk (with work pulled in-house during recessions) imply little or no systematic difference in the labor employed in parent firms and subcontractors. The risk argument, in fact, implies that they will be identical. The statistical data presented above indicate that this is not so, as do the case studies, but a test using firm-level data would be stronger. As far as the author knows, such data do not exist. Second, the author elsewhere presents a chronology of the development of subcontracting in the automotive industry; if this does not parallel (or lag) the evolution of labor market practices, then it will imply that homogeneity was not important historically, though managers view it as important now. Last, if labor is not important in the cost structure of the industry, then it will make suspect an emphasis on labor markets. For Nissan Diesel, direct labor is about 10% of total costs (profit is 1%). With labor intensive tasks being subcontracted, this would be more important. Again, firm-level data on labor inputs and labor costs would be needed to formalize the potential cost disadvantage of vertical integration. (Ideally, data should be from the time that the decision to "buy" was made, since such decisions may be costly to reverse.) And again, the author knows of no such data set. But neither does he have any reason to believe that such a test would show labor cost differentials to be unimportant for total costs.

## Section VI. Conclusions

This paper has noted that manufacturing in Japan is in general less integrated vertically than in the U.S., and that there is corresponding a larger share of small firms in Japanese industry. It argues that one cause of this is the structure of internal labor markets, most obvious in the "lifetime employment" of the enterprise unionism of large firms, which exerts a strong force towards the employment of a homogeneous labor force. Given the inherent variety of inputs in the manufacture of products such as automobiles, firms are then encouraged to utilize outside suppliers as a more efficient source of disparate labor inputs. In support of this thesis, evidence of the homogeneity of the internal labor markets of firms, both large and small, was developed using case studies, standard statistical sources, and an examination of the structure of Japanese labor relations.

In the real world many "markets" necessary for Walrasian utopia either do not exist or are imperfect. Firms exist because the fill in or alleviate some of these lacunae. The theory of the firm, however, must move beyond the study of "generic" market failures -- e.g., monopoly -- to be of much interest. One development in this direction is the transactions cost approach, with its emphases on governance, asset specificity and asymmetric information as they relate to the feasibility and costs of "contracting". This paper argues that the structure of factor markets must also be analyzed, and in doing so develops a the theory of the firm which complements the transactions cost approach.

This theory is developed in the context of a specific aspect of factor market organization, that of the homogeneity of the labor markets within Japanese firms. The purpose is not however to analyze an "interesting" feature of labor markets; the essence of the theoretical point made herein is that such "non-economic" facets of market organization are central to an understanding of the firm. Again, while this paper is a focused study, the claim is that the approach is general. Other parts of the dissertation of which this paper is a part examine parallel arguments for other factor markets, such as those for capital and land. In it the development of subcontracting in the that of automotive parts suppliers is traced, and it is argued that there have been innovations in management which have facilitated both the utilization of outside suppliers and more rapid cost reduction through product design and process engineering.

As a closing note, subcontracting is currently garnering more attention in American manufacturing; the efforts of Xerox in this regard have been well publicized.[69] In the automotive industry, GM has announced that it plans to move 10% of its current parts production to outside suppliers by the end of 1987.[70] Firms are often explicit in noting that this is being done as a means to control labor costs; GM workers went out on strike in late March 1987 over subcontracting (among other issues).[71] Finally, controlling labor costs is important because US firms are homogeneous as well; firms are constrained in the distinctions they can make in compensation:

*Two-tier wage systems falter*
*as companies sense workers' resentment.*

The percentage of new labor contracts with two-tier wage structures -- which pay workers hired after a certain date less than others with the same job -- declined last year for the first time since 1983, says the Conference Board, New York. From 1983 through 1985, the share of two-tier systems in new contracts rose to 11% from 5%. But the proportion declined to 10% last year.

Once seen as an equitable way to control wages, two-tier systems now are thought by many to be too damaging to morale. The International Association of Machinists says two-tier pay hasn't bee an issue in its recent contract talks. The Food and Commercial Workers Union also sees its decline.

*A roman emperor's use of a two-tier pay system for his army in 217 A.D. resulted in his assassination, according to historian Edward Gibbon.*

-- Wall Street Journal, June 16, 1987, page 1.
Italics / emphases from the original.

## NOTES

1. Williamson [1975] also presents models of loss-of-control, and using this and other organizational and incentive issues argues as well that there are limits on the scope of a firm.

2. Data are from Nissan Jidosha Chosabu [1983].

3. Relatively few small establishments are part of larger firms, so that at the small end of the spectrum this is a good proxy for the more desirable measure of firm size. For more on small firms, see Patrick and Rohlen [forthcoming].

4. *WSJ* July 10, 1987, p. 6, "Magna Industries Aims at the Big Picture".

5. The article on Magna Industries cited above makes the same point; Magna has avoided unionization through a strategy of utilizing scattered, small factories. In its integration of skilled personnel (tool and die makers) it also parallels Japanese auto suppliers.

6. Joskow [1985] gives examples of contracting between coal mines and adjacent electric generating facilities; Corey [1978] gives an example of the independent "Green River Glass" placing a factory across the street from a Heinz ketchup bottling plant.

7. The brake example will be analyzed in the overview of the automotive parts industry, as part of one chapter of my dissertation. These joint ventures included those with foreign rivals of Bendix, which had three Japanese licensees in different segments; and joint ventures with these Japanese firms.

8. See the case study of the Mizushima industrial park appearing in my dissertation. Interview data suggests that labor market considerations have been primary, tax / financial reasons distinctly secondary.

9. Note that assembly in Japan *is* subcontracted to other firms; Subaru (Fuji Juko) assembled vehicles for Nissan until 1987, while Daihatsu is one of several firms assembling Toyotas. This is no longer unique to Japan, as Chrysler arranged for AMC to assemble certain models prior to their merger proposal. See WSJ, 9/26/86, pg. 14. GM and other companies in the US import cars from affiliates for sale under their own label, but in general these have been designed and manufactured independently by these affiliates.

10. It has been a Japanese Marxist contention since the late 1930's that the primary function of subcontracting is to exploit cheap labor. (A secondary function was to force risk on to subcontractors by pulling work in during slow periods). See, for example, Komiyama [1941] or the literature survey of Shinohara [1968]. In the English language literature, the most explicit statement I have located is quite literally in a footnote:

> An additional limitation, not discussed in the text, that integrated forms of organization may experience in relation to nonintegrated is that wage bargains may be insufficiently discriminating in the former -- especially in firms that have access to monopoly power. (An example is afforded by seat belt manufacture in the automobile industry. Despite small-numbers supply, with the attendant bargaining problems, as well as indications of supernormal profits among its suppliers, General Motors has not integrated backward into own-supply but rather contracts for these items. A principal reason for this refusal to integrate backward is that General Motors would be required to pay higher labor costs under its labor contract with the United Auto Workers than are its much smaller, independent outside suppliers.) Williamson [1975], p. 130, note 17 *infra*.

11. Other institutional and market imperfection arguments can be found in the literature. The theory of teams and economies of scope are an example of the latter; economies of scale (market power) have already been mentioned.

12. The value analysis literature shows that empirically it is not appropriate to assume that designs leaving an engineer's desk, or carried over from a previous model, will be optimal or even very good from a cost standpoint. See Miles [1972]. This suggests that incentives for incremental technical change are very important, an issue to be discussed elsewhere by the author.

13. In Japan family enterprise and self-employment is substantial, on the order of 1/5 of the labor force.

14. To state this formally, a cross-section regression model of individual wages against these characteristics will have a high R-squared, which the author believes is a reasonable description of the results of such empirical studies.

15. Note that the author's observation is that Japanese firms have proportionately larger personnel departments than American firms, once payroll and other regulatory / accounting functions are excluded, while survey studies comparing Japanese and US firms show that the personnel functions are viewed as carrying more status in Japan. (Source is Marsh and Mannari

[1976]?) But as there is more decentralization and use of "postings" in US firms, more of the personnel function is performed outside of the personnel department, making such comparisons at best suggestive.

16. In addition to the material below, there is a vast Japanese literature on dualism, largely Marxist in orientation, extending back over 50 years. While largely peripheral to the discussion herein, the author does not accept the view of this literature that wage differentials are a sign of "exploitation" rather than result of varying human abilities, ambitions and skill acquisition (unobservables) -- and sex discrimination. For reviews of this literature see Shinohara [1968] and Yokokura [forthcoming]. On dualism more generally, see Cain [1976]. On sex discrimination in Japan, see Smith [1987].

17. Kyoikusha [1980], p. 136 gives comparative data on 9 of the Japanese automotive firms; it does not include Nissan Diesel, or Mitsubishi Motors (for which financial statements are not publicly available). Data on Nissan Diesel is from their 1983 financial statement (*Yuka Shoken Hokoku Sho*).

18. See Kodaira [1968], pp. 330f for an account of the spinning off of Minsei Diesel from Minsei Sangyo and its decline and subsequent absorption by Nissan.

19. Land for employee housing is reported to comprise 8% of book value assets for Nissan. Such housing is a common benefit of large firms -- see, for example, Kamata [1982]. A list of facilities in its annual report shows Nissan Diesel is no exception. If a market rate of return is imputed to such non-productive assets, then benefits can be significantly higher. Note also that retirement benefits are not fully funded, so that #8 underestimates this element of compensation, and probably by a very substantial margin, given the practices of many Japanese firms.

20. This is from an all-industry summary of the *Chingin Kozo Kihon Tokei Chosa (1984)* (Basic Survey of Wage Structure) in the Ministry of Labor monthly, *Rodo Jiho*, June 1985, pg. 59, Table 8. "Part-time" workers are defined as those whose work-day in hours or work-week in days are less than the standard set for regular employees. Note average wages are less than those in large firms, and tend to be less than those in medium sized firms as well, indicating that most *paato* work in small firms. Average "regular" female worker wages are substantially higher, averaging ¥176,000 or about ¥978 per hour with a 180-hour work-month in large firms (ibid, p. 58, Figure 6); they will in addition be paid bonuses (of four months or more of their regular pay ==> effectively ¥1303 per hour) and receive more benefits. *Paato* are thus probably paid less than half on average of other female

workers of the same age -- but comparatively few women in the older age brackets are "regular" workers; most leave the labor force at some point and must re-enter as *paato*.

21. There is an extensive literature on this topic. For a survey on "dualism" see Shinohara [1966] and for an empirical study, Taira [1970]. For current work, see the various studies of Koike [1983a, 1983b, 1983c, 1981], Sterling [1984] and Wood [1984]. Younger workers are paid very similarly; most of the differential arises from age 30 on, when wages flatten out in smaller firms but continue rising until age 40 in larger firms. Finally, Odaka [1984] is a detailed, firm-level analysis of wages in manufacturing, although it deals primarily with the pre-World War II period. These numbers in specific come from Odaka [1984], p. 270, Figure 8-4.

22. Table 7, pg. 20, *Rodo Tokei Chosa Geppo* 36:5 (May 1984), wages for male employees working at same firm since graduation from school, 1983. For high school graduates, pay during ages 25-29 is exactly the same (¥177.3 thousand) as that of college graduates (both white collar jobs), and only 4.4% more than that for junior high school graduate production (blue collar) workers. For ages 30-34, high school grad wages (¥221.7 thousand) are 93.8% and junior high school grad wages (¥204.3 thousand) are 86.5% of those of college grads (¥236.3 thousand).

23. *Chusho Kigyo Hakusho*, 1983, p. 141, Figure 1-2-8. Underlying source was *Chingin Kozo* and its predecessors. Note that in 1961 very few workers would have had 20 years or more tenure.

24. The names of these firms have been suitably disguised.

25. Common observations are that large firms hire from the top half of high-school graduates, and that they also invest more in on-the-job training.

26. See Sterling [1984] for some econometric studies.

27. Chusho Kigyo Cho, *Chusho Kigyo Hakusho* [1983], Appendix tables 11, 17 and 19.

28. By this standard, the wages of Nissan Diesel appear to be lower than expected of a firm of its size.

29. *Chusho Kigyo Hakusho*, 1983, Appendix table 34.

30. Chusho Kigyo Hakusho, 1983, p. 136, Figure 1-2-2. Underlying source, Sorifu, Rodo Ryoku Chosa.

31. Ibid, p. 138, Figure 1-2-4, based on Chinqin Kozo.

32. Chusho Kigyo Hakusho, 1983, p. 139, Figure 1-2-5. Underlying source, Chinqin Kozo. See also Patrick and Rohlen [forthcoming].

33. Odaka [1984], p. 261, Figure 8-1. This is based on an index correcting for sex, age and white versus blue collar, using 1970 weights and a 7-year moving average; the data is for 1954-1979. Productivity (value added per employee) in larger firms ranged from 3.7 times that of smaller firms in 1960 to 2.3 times in 1975. The data is for monthly wages, and thus does not include bonuses and benefits. This understates the differential because workers in small firms typically receive few benefits, while in large firms bonuses typically account for 25% or more of cash compensation and benefits add another 20% on top of this to firms' costs.

34. As would be true for a labor-managed firm. Evans [1986] examines Japanese labor relations in terms of such models.

35. Thanks to Hugh Patrick for this point. Concern with pay distinctions is not unique to Japan; pay scales are confidential at the university where the author works, and in point of fact pay is not discussed openly. All are aware that there are distinctions (economists, thankfully, are paid more than academics in the humanities), but an interest in collegiality prevails and no one wants in practice to bring it up.

36. Page 13. Quoting at some length:

> Why is it, then, that a system which was basically designed and established by man to begin with cannot be easily reformed? This question is dealt with in detail in Chapter 7, but at this point I shall offer three explanations. First, it is conceivable that when a certain system has spread widely and struck roots in a society, the very fact that it has socially settled in would enable the system to display a strong constraining force. Second, each individual system, as a part of the overall system and together with the other systems, comprises an overall conglomerate unity. Therefore, it is easy to imagine that the reform of one system would generate various far-reaching implications for other areas within that institutional conglomerate. Thus, resistance comes from these other parts. Thirdly, some of the systems are bound to be intimately connected with

> the unique psychological traits recognized among the people in the society. This tendency can be all the stronger in cases where there is a close connection with human affairs, in particular with matters related to personal status. Thus, an attempt at reforming a system sometimes encounters enormous psychological resistance from people. This sort of psychological resistance is different in nature from the perplexity accompanying relatively simple transfer of systems, which is basically a mixture of bewilderment and confusion brought about by the feeling of unfamiliarity. The psychological resistance we are talking about here can have a pervasive impact on the formation process of a system.

37. Ibid., pg. 72. In his introduction, Iwata stresses that his models abstract from reality, but that the Japanese reader (manager) can readily add qualifications, and note divergences from the "pure" model. He cautions that foreign readers should realize that his models are deliberate exaggerations. In my own experience, a "fast-track" group is visible in large firms from very early on, and others do "opt out". There is even a term for such people, the *madogiwa-zoku*. (Government bureaucracy, with its rigid tracking, is infamous for this.) But within the fast-track group, care is taken to keep relative status obscure. In most manufacturing companies, high school graduates are off of the "fast-track" from the start, though not without their own career ladder. For more in the way of nuances, consult among others Rohlen [1974], Cole [1971, 1979] or Clark [1979].

38. Sakiya [1981], p. 177.

39. See the quote from Iwata on labor relations as an economy-wide system in endnote 32 above.

40. Other basic references in English include chapters in Shirai (ed.) [1983], Fruin [1978], [1983], Sterling [1984], and Koike [1983c] (in Japanese see the last chapter of Koike [1981]).

41. Taira [1970] had earlier argued that, contrary to being "traditional", the current system did not predate the early 1920's, and was not widespread until the 1950's.

42. For the U.S., see Buttrick [1952] and Chandler [1964].

43. Capital per worker increased substantially in these firms; Gordon posits (p. 52f) that direct intervention improved capacity utilization, which had become an important consideration.

54. Gordon also notes the above changes. He states that the use of evaluations was implemented in many firms in the 1950s (Gordon [1985], p. 380), but that "job" was a rank or title rather than a wage criterion. He also notes (ibid., p. 385) the lessening of the age-wage gradient, interpreting it as a reflection of the political pressures of the young dominating union membership.

55. Rodosha Chosa Kenkyu Kai [1983], p. 170 suggests faster divergence, e.g., some are promoted after the first 5 years.

On Daihatsu, p. 106 notes that a group leader system was introduced in 1957 and a rank / ability system in 1962, replacing an incentive pay system, which in fact resulted in the same payment for all, pp. 109-110. In fact these brought about little change in actual promotion / compensation practices; only the later tie-up with Toyota led to change from around 1970. See other chapters in the book for a Marxist critique of the contemporary employment system in other automotive firms.

Nihon Seisansei Honbu [1966, 1969] gives accounts of Isuzu, scattered through the text; Miyashita [1971], pp. 292-299 gives a systematic account. Isuzu adopted an ability pay system in place of a "Densan" system in 1959-1960. This was because the introduction of automation with the modernization around that time led to the hiring of a large number of relatively unskilled machine operatives, while the existing workforce had been primarily skilled workers / machinists; tracking was needed to provide these more skilled workers with a pay differential. For such new hires (when they were without experience) pay increases / promotions were near-automatic for the first couple tiers, so that differentials did not arise until after many years in the firm. (For those hired with outside experience, there were conversion scales to locate them at a rung on the ladder reflecting relevant experience, education *and* *age*.)

Yamamoto [1978, 1981], as noted earlier, is an analysis of Nissan, while *Chuo Koron Keiei Mondai*, 5:2 (Summer 1966), pp. 209-216 discusses Toyo Kogyo, hinting that as the only automotive firm outside of a traditional industrial region it was not as typical as the other auto firms in its practices. Cole [1979] discusses Toyota Shatai and Nishiguchi [1986], Toyota.

56. Note that promotions to foreman pay rank peak around age 40, so average compensation in large firms does not peak until later.

57. This is not the case with all industries; electronics firms historically have employed large numbers of women. The automotive industry initially employed skilled workers, while women lacked the requisite experience, and often involved heavy work, shift work or extensive overtime, which under Japanese labor laws made employing women difficult, or which was viewed by both women and employers as undesirable work for women.

44. The bureaucracy and the military may have provided other models; the author knows of no discussion of these, although Gordon [1985], p. 48 does refer to railways in passing.

45. See Cusumano [1985] for a description of the rise and defeat of the radical labor movement at Nissan.

46. The views of Profs. Koike and Shimada are from private conversations, and from statements of the latter at the Japan Economic Seminar. Among others, see Gordon [1985], p. 345 on the nature of labor agreements. Koji Taira has also expressed similar views to the author, pointing out that the rules on employment of *paato*, for example, are almost certainly not in the collective bargaining agreements of these firms.

47. Rodosho [1954]. The name of this survey varies with the date; see the Bibliography for citations. For convenience, the current appellation is used here.

48. Mori [1978] gives a list of "model wage" surveys by prefectural and local employers' associations and governments which utilize as the main categories education, sex, age-*cum*-tenure and white-*versus* blue-collar and industry. The large-firm permanent employment system is held up as a model, albeit one which cannot be followed exactly: for smaller firms, more reference must be made to interfirm labor markets.

49. Okamura [1974], pp. 283-5.

50. Kato Shatai Kogyo [1971], pp. 171-8. The author has visited both Kato Shatai and several of its suppliers.

51. Takagi and Fukami [1974], pp. 80-83. Gordon [1985], p. 353 gives a varying decomposition. On the new postwar pattern, see ibid. pp. 337 - 360. Marsh and Mannari [1976] provide several excellent case studies, including one of steel.

52. Suzuki [1969], p. 80 Table 35, apparently using a 1966 Ministry of Labor survey. Other surveys are cited by T. Ono [1980].

53. For this see Okamura [1974], pp. 177-203; evaluation forms are on pp. 185-198. The "model" wage and details of the pay system are on p. 278-85. The final chapter of Koike [1981] compares the age-wage profiles of employees in large- and medium-scale firms, showing a similar peak for workers in large firms; those in smaller firms, however, reached peak pay at age 30.

58. *Chuo Koron Keiei Mondai*, 2:2 (Summer 1963), p. 344; ibid., 5:2 (Summer 1966), p. 209-216.

59. Gordon [1985], pp. 401-407 discusses temporary workers, with data for Toshiba for 1958-1983. Such workers increased from 24% of the work force in 1958 to a peak of 33% in 1960, but have comprised less than 10% of employees since 1964. They increased to 2% (5.8%) during the 1972(3) expansion from 1.4% in 1971, but fell to less than 1% in the subsequent recession, and in 1983 were 2.5% of the work force. Nissan is discussed by Cusumano [1985]; the data here is from page 415, note 43. Toyota is discussed by Nishiguchi [1986] and by Allinson [1975], pp. 178-9.

60. Yamamoto [1981], pp. 68-9 and pp. 60-62 detail this for Nissan; see the references in the above footnote as well.

61. Ibid., p. 62 and Table 6, p. 60.

62. Miyashita [1971], pp. 292-99.

63. Interviews, Nissan and Honda union officials, Fall 1984.

64. Nihon Seisansei Honbu [1969], p. 250.

65. See Patrick and Rohlen [forthcoming] on family enterprise in Japan and the references therein, as well as Wood [1984].

66. See Chandler [1964] and Jacoby [1985], and the review of the latter in the *Journal of Economic Literature*, September 1986. Note also that the theory of efficient contracting in labor markets has now produced theories of internal labor markets with normative implications that appear to correspond well to reputed "Japanese" practice. For a brief discussion see Chapter 11 in Ehrenberg and Smith [1985].

67. *Wall Street Journal*, January 27, 1987.

68. See Asanuma [1986] for an English-language comparison of subcontracting in the Japanese auto and electronics industries.

69. Along with media coverage, see Jacobson and Hillkirk [1986].

70. *Wall Street Journal*, January 27, 1987.

71. *Wall Street Journal*, March 27, 1987.

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# Table 4-5

## Census of Manufactures Auto Industry Data, 1983

| Auto (361), 1983 | Estab | Employees | Average Regular Employees | Wages ¥ mil | Materials ¥ million | Shipments ¥ million | Output ¥ mil | Value Added ¥ million | W/Empl ¥ million | W/Empl As % of 1000+ Level |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/Average | 10580 | 698690 | 612947 | 2601509 | 17401409 | 25450874 | 24685804 | 6610225 | ¥3723410 | 82.5% |
| 4-9 empl. | 5275 | 31972 | - | 60787 | 81896 | 199717 | - | 117802 | ¥1901257 | 42.1% |
| 10-19 empl. | 1986 | 27697 | - | 65472 | 143506 | 275514 | - | 123187 | ¥2363866 | 52.4% |
| 20-29 empl. | 1111 | 27301 | - | 66373 | 184379 | 326878 | - | 132385 | ¥2431156 | 53.9% |
| 30-49 empl | 645 | 25261 | 25059 | 67019 | 248586 | 393822 | 393786 | 133893 | ¥2653062 | 58.8% |
| 50-99 empl | 689 | 47644 | 47595 | 131996 | 561237 | 847768 | 849475 | 259026 | ¥2770464 | 61.4% |
| 100-199 empl | 384 | 52364 | 52179 | 161588 | 756691 | 1077636 | 1082470 | 289615 | ¥3085861 | 68.4% |
| 200-299 empl | 151 | 36812 | 37226 | 122478 | 615411 | 865953 | 866622 | 216576 | ¥3327122 | 73.7% |
| 300-499 empl | 125 | 47975 | 48361 | 175345 | 840489 | 1221981 | 1223152 | 320989 | ¥3654924 | 81.0% |
| 500-999 empl | 119 | 83525 | 83706 | 314447 | 1575480 | 2402770 | 2396786 | 710582 | ¥3764705 | 83.4% |
| 1000+ empl | 95 | 318139 | 318821 | 1436003 | 12393733 | 17838835 | 17873513 | 4306169 | ¥4513760 | 100.0% |

| Assm (3611),1983 | Estab | Employees | Average Regular Employees | Wages ¥ mil | Materials ¥ million | Shipments ¥ million | Production ¥ million | Value Added ¥ million | W/Empl | W/Empl As % of 1000+ Level |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/Average | 47 | 191480 | 192946 | 892525 | 9328523 | 13642578 | 13662417 | 3399361 | ¥4661192 | 99.5% |
| 30-49 empl | 1 | x | x | x | x | x | x | x | - | - |
| 50-99 empl | 2 | x | x | x | x | x | x | x | - | - |
| 100-199 empl | 1 | x | x | x | x | x | x | x | - | - |
| 300-499 empl | 3 | 1135 | 1185 | 4925 | 33451 | 41128 | 40428 | 6294 | ¥4339207 | 92.6% |
| 500-999 empl | 5 | 3651 | 3815 | 13666 | 165295 | 246520 | 237593 | 64944 | ¥3743084 | 79.9% |
| 1000+ empl | 35 | 186334 | 187592 | 872824 | 9124830 | 13346886 | 13367457 | 3325264 | ¥4684191 | 100.0% |

| Body (3612),1983 | Estab | Employees | Average Regular Employees | Wages ¥ mil | Materials ¥ million | Shipments ¥ million | Production ¥ million | Value Added ¥ million | W/Empl | W/Empl As % of 1000+ Level |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/Average | 200 | 51005 | 49620 | 207812 | 1370723 | 1790187 | 1773921 | 378638 | ¥4074346 | 91.4% |
| 4-9 empl. | 1 | x | - | x | x | x | - | x | x | x |
| 20-29 empl. | 59 | 1461 | - | 4484 | 12019 | 20440 | - | 8050 | ¥3069131 | 68.9% |
| 30-49 empl | 42 | 1593 | 1599 | 4924 | 11046 | 18466 | 18456 | 7077 | ¥3091023 | 69.4% |
| 50-99 empl | 34 | 2385 | 2413 | 7592 | 20017 | 31329 | 31428 | 10865 | ¥3183229 | 71.4% |
| 100-199 empl | 24 | x | 3292 | x | x | x | 84809 | x | - | - |
| 200-299 empl | 10 | 2390 | 2394 | 8890 | 28984 | 44287 | 44437 | 14475 | ¥3719665 | 83.5% |
| 300-499 empl | 7 | 2669 | 2715 | 10594 | 49730 | 73437 | 73151 | 21632 | ¥3969277 | 89.1% |
| 500-999 empl | 11 | 7933 | 8236 | 29956 | 165911 | 260344 | 258312 | 88647 | ¥3776125 | 84.7% |
| 1000+ empl | 12 | 29266 | 28970 | 130400 | 1026097 | 1259806 | 1263328 | 201378 | ¥4455682 | 100.0% |

| Parts(3613),1983 | Estab | Employees | Average Regular Employees | Wages ¥ mil | Materials ¥ million | Shipments ¥ million | Production ¥ million | Value Added ¥ million | Wages/Empl | W/Empl As % of 1000+ Level |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/Average | 10333 | 456205 | 370381 | 1501172 | 6702163 | 10018109 | 9249466 | 2832226 | ¥3290565 | 78.0% |
| 4-9 empl. | 5274 | x | - | x | x | x | - | x | - | - |
| 10-19 empl. | 1986 | 27697 | - | 65472 | 143506 | 275514 | - | 123187 | ¥2363866 | 56.0% |
| 20-29 empl. | 1052 | 25840 | - | 61890 | 172361 | 306438 | - | 124334 | ¥2395124 | 56.7% |
| 30-49 empl | 602 | x | x | x | x | x | x | - | - | - |
| 50-99 empl | 653 | x | x | x | x | x | x | - | - | - |
| 100-199 empl | 359 | 48906 | 48726 | 150092 | 697000 | 991392 | 993393 | 261866 | ¥3068989 | 72.7% |
| 200-299 empl | 141 | 34422 | 34832 | 113589 | 586426 | 821666 | 822185 | 202101 | ¥3299895 | 78.2% |
| 300-499 empl | 115 | 44171 | 44461 | 159827 | 757307 | 1107416 | 1109573 | 293063 | ¥3618370 | 85.7% |
| 500-999 empl | 103 | 71941 | 71655 | 270825 | 1244274 | 1895905 | 1900881 | 556991 | ¥3764543 | 89.2% |
| 1000+ empl | 48 | 102539 | 102259 | 432779 | 2242807 | 3232143 | 3233728 | 779528 | ¥4220628 | 100.0% |

# Table 4-6

Auto Industry Firm Size / Average Wage for Selected Years
(Census of Manufactures)

| Auto (361) | Wages/Empl 1959 ¥ million | Wages/Empl 1961 ¥ million | Wages/Empl 1966 ¥ million | Wages/Empl 1971 ¥ million | Wages/Empl 1983 ¥ million |
|---|---|---|---|---|---|
| Total/Average | ¥251,446 | ¥308,998 | ¥506,798 | ¥1,005,483 | ¥3,723,410 |
| 4-9 empl. | ¥135,201 | ¥187,213 | ¥268,750 | ¥541,113 | ¥1,901,257 |
| 10-19 empl. | ¥154,476 | ¥208,931 | ¥384,942 | ¥775,065 | ¥2,363,866 |
| 20-29 empl. | ¥162,764 | ¥223,885 | ¥414,535 | ¥834,506 | ¥2,431,156 |
| 30-49 empl | ¥167,931 | ¥235,948 | ¥408,683 | ¥809,789 | ¥2,653,062 |
| 50-99 empl | ¥183,614 | ¥235,198 | ¥428,427 | ¥804,514 | ¥2,770,464 |
| 100-199 empl | ¥186,406 | ¥251,755 | ¥445,551 | ¥885,340 | ¥3,085,861 |
| 200-299 empl | ¥210,431 | ¥277,752 | ¥450,213 | ¥945,342 | ¥3,327,122 |
| 300-499 empl | ¥250,386 | ¥258,008 | ¥456,606 | ¥969,022 | ¥3,654,924 |
| 500-999 empl | ¥235,604 | ¥307,615 | ¥480,448 | ¥985,349 | ¥3,764,705 |
| 1000+ empl | ¥376,181 | ¥414,949 | ¥593,403 | ¥1,163,612 | ¥4,513,760 |

| Assm (3611), 1983 | W/Empl 1959 ¥ million | W/Empl 1961 ¥ million | W/Empl 1966 ¥ million | W/Empl 1971 ¥ million | W/Empl 1983 ¥ million |
|---|---|---|---|---|---|
| Total/Average | ¥180,114 | ¥180,114 | ¥619,771 | ¥1,183,649 | ¥4,661,192 |
| 4-9 empl. | x | x | - | x | - |
| 10-19 empl. | ¥163,953 | ¥238,095 | ¥437,939 | x | - |
| 20-29 empl. | ¥191,176 | ¥272,727 | - | x | - |
| 30-49 empl | x | -- | - | x | - |
| 50-99 empl | ¥134,356 | x | - | x | - |
| 100-199 empl | ¥272,008 | ¥265,180 | - | x | - |
| 200-299 empl | ¥234,739 | ¥350,501 | - | x | - |
| 300-499 empl | ¥312,794 | ¥252,408 | - | x | ¥4,339,207 |
| 500-999 empl | ¥217,672 | ¥346,304 | ¥574,377 | ¥870,216 | ¥3,743,084 |
| 1000+ empl | ¥407,289 | ¥422,614 | ¥622,071 | ¥1,191,752 | ¥4,684,191 |

| Parts (3613) 1983 | W/Empl 1959 ¥ million | W/Empl 1961 ¥ million | W/Empl 1966 ¥ million | W/Empl 1971 ¥ million | W/Empl 1983 ¥ million |
|---|---|---|---|---|---|
| Total/Average | ¥196,966 | ¥266,440 | ¥439,078 | ¥896,586 | ¥3,290,565 |
| 4-9 empl. | ¥134,203 | ¥186,844 | ¥266,817 | ¥541,113 | - |
| 10-19 empl. | ¥153,727 | ¥206,943 | ¥381,552 | ¥771,418 | ¥2,363,866 |
| 20-29 empl. | ¥160,379 | ¥220,392 | ¥411,093 | ¥833,500 | ¥2,395,124 |
| 30-49 empl | ¥164,839 | ¥232,298 | ¥403,272 | ¥795,255 | - |
| 50-99 empl | ¥179,915 | ¥229,355 | ¥417,876 | ¥797,012 | - |
| 100-199 empl | ¥177,082 | ¥248,126 | ¥434,272 | ¥870,208 | ¥3,068,989 |
| 200-299 empl | ¥208,853 | ¥267,602 | ¥436,056 | ¥919,480 | ¥3,299,895 |
| 300-499 empl | ¥231,500 | ¥260,245 | ¥440,649 | ¥961,313 | ¥3,618,370 |
| 500-999 empl | ¥248,542 | ¥302,683 | ¥462,764 | ¥982,668 | ¥3,764,543 |
| 1000+ empl | ¥313,599 | ¥408,869 | ¥543,414 | ¥1,085,808 | ¥4,220,628 |

Minimum and Maximum (column): all, assembly, body and parts: SIC 361, 3611, 3612, 3613

| | | | | | |
|---|---|---|---|---|---|
| | ¥134,203 | ¥180,114 | ¥266,817 | ¥541,113 | ¥1,901,257 |
| | ¥407,289 | ¥422,614 | ¥622,071 | ¥1,199,963 | ¥4,684,191 |
| The minimum as percent of maximum: | 33% | 43% | 43% | 45% | 41% |

Table 4-7

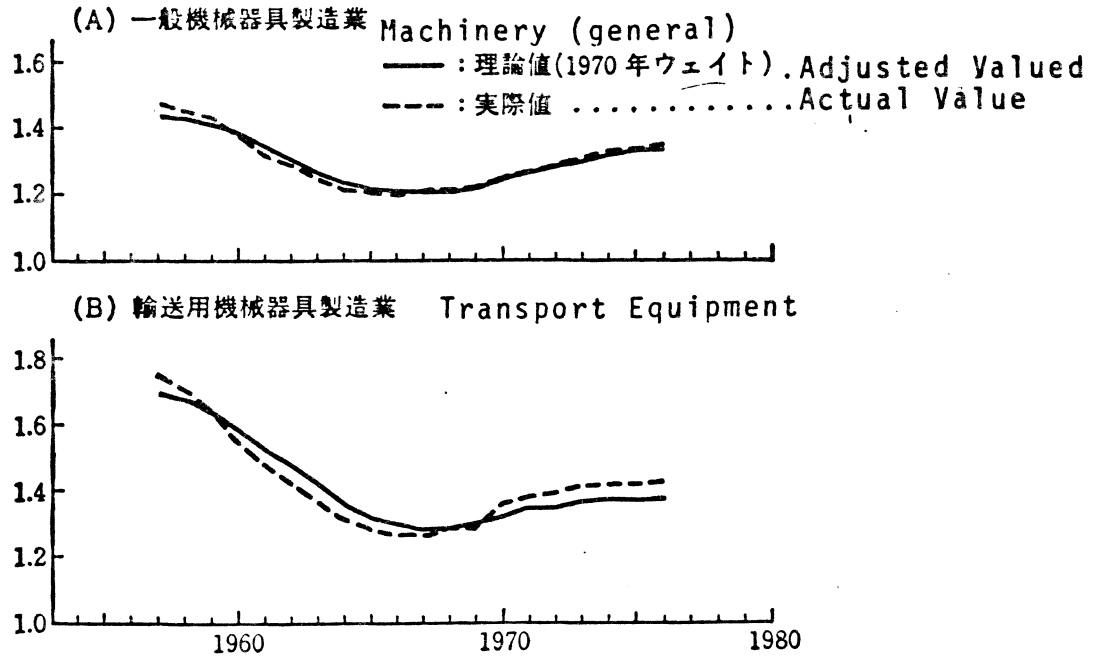
## Comparison of Automotive Wages with Minimum Wage, U.S.

| Year | Transport All Empl | Trans Factory Empl | Manu $/hr | Trans $/hr | Auto hrs/wk | Auto $/hr | Wage Differ trans manu | Min Wage | Wage Differ manu/min | Wage Differ trans/min | Wage Differ trans/auto | All Auto Factory Employment | Year |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1986 | | | | | | | | | | | | | |
| 1985 | | | | | | | | | | | | | |
| 1984 | 1906 | | 9.18 | 12.22 | 43.80 | 12.74 | 1.33 | 3.35 | 2.74 | 3.65 | 1.04 | -- | 1984 |
| 1983 | 1747 | | 8.83 | 11.62 | 43.30 | 12.14 | 1.32 | 3.35 | 2.64 | 3.47 | 1.04 | -- | 1983 |
| 1982 | 1744 | | 8.50 | 11.12 | | | 1.31 | 3.35 | 2.54 | 3.32 | -- | -- | 1982 |
| 1981 | 1898 | | 7.99 | 10.39 | | | 1.30 | 3.35 | 2.39 | 3.10 | -- | -- | 1981 |
| 1980 | 1875 | | 7.27 | 9.32 | | | 1.28 | 3.10 | 2.35 | 3.01 | -- | -- | 1980 |
| 1979 | 2077 | | 6.70 | 8.53 | | | 1.27 | 2.90 | 2.31 | 2.94 | -- | -- | 1979 |
| 1978 | 1992 | | 6.17 | 7.91 | | | 1.28 | 2.65 | 2.33 | 2.98 | -- | -- | 1978 |
| 1977 | 1872 | | 5.68 | 7.28 | | | 1.28 | 2.30 | 2.47 | 3.17 | -- | -- | 1977 |
| 1976 | 1733 | | 5.19 | 6.54 | | | 1.26 | 2.30 | 2.26 | 2.84 | -- | -- | 1976 |
| 1975 | 1649 | | 4.81 | 6.02 | | | 1.25 | 2.10 | 2.29 | 2.87 | -- | -- | 1975 |
| 1974 | 1821 | | 4.41 | 5.48 | | | 1.24 | 2.00 | 2.21 | 2.74 | -- | -- | 1974 |
| 1973 | 1904 | | 4.08 | 5.07 | | | 1.24 | 1.60 | 2.55 | 3.17 | -- | -- | 1973 |
| 1972 | 1747 | | 3.81 | 4.73 | | | 1.24 | 1.60 | 2.38 | 2.96 | -- | -- | 1972 |
| 1971 | 1724 | | 3.56 | 4.41 | | | 1.24 | 1.60 | 2.23 | 2.76 | -- | -- | 1971 |
| 1970 | 1807 | | 3.36 | 4.06 | | | 1.21 | 1.60 | 2.10 | 2.54 | -- | -- | 1970 |
| 1969 | 2061 | | 3.19 | 3.89 | | | 1.22 | 1.60 | 1.99 | 2.43 | -- | -- | 1969 |
| 1968 | 2028 | | 3.01 | 3.69 | | | 1.23 | 1.60 | 1.88 | 2.31 | -- | -- | 1968 |
| 1967 | 1948 | | 2.83 | 3.44 | | | 1.22 | 1.40 | 2.02 | 2.46 | -- | -- | 1967 |
| 1966 | 1912 | 1361.00 | 2.72 | 3.33 | 42.80 | 3.44 | 1.22 | 1.25 | 2.18 | 2.68 | 1.03 | 1.29 | 1965 |
| 1965 | 1741 | 1241.00 | 2.61 | 3.21 | 44.20 | 3.34 | 1.23 | 1.25 | 2.09 | 2.57 | 1.04 | 1.28 | 1965 |
| 1964 | 1745 | 1133.00 | 2.53 | 3.10 | 43.00 | 3.21 | 1.23 | 1.25 | 2.02 | 2.46 | 1.04 | 1.30 | 1964 |
| 1963 | 1609 | 1113.00 | 2.46 | 3.01 | 42.80 | 3.10 | 1.22 | 1.15 | 2.14 | 2.62 | 1.03 | 1.08 | 1963 |
| 1962 | 1542 | 1061.00 | 2.39 | 2.91 | 42.70 | 2.99 | 1.22 | 1.15 | 2.08 | 2.53 | 1.03 | 1.30 | 1962 |
| 1961 | 1459 | 997.00 | 2.32 | 2.80 | 40.10 | 2.86 | 1.21 | 1.00 | 2.32 | 2.80 | 1.02 | 1.32 | 1961 |
| 1960 | 1617 | 1133.00 | 2.26 | 2.74 | 41.00 | 2.81 | 1.21 | 1.00 | 2.26 | 2.74 | 1.03 | 1.28 | 1960 |
| 1959 | 1670 | 1810.00 | 2.19 | 2.64 | 41.10 | 2.71 | 1.21 | 1.00 | 2.19 | 2.64 | 1.03 | 1.29 | 1959 |
| 1958 | 1593 | 1124.00 | 2.13 | 2.53 | 39.20 | 2.55 | 1.19 | 1.00 | 2.13 | 2.53 | 1.01 | 1.31 | 1958 |
| 1957 | 1878 | 1384.00 | 2.07 | 2.41 | 40.00 | 2.46 | 1.16 | 1.00 | 2.07 | 2.41 | 1.02 | 1.25 | 1957 |
| 1956 | 1831 | 1358.00 | 1.98 | 2.31 | 40.30 | 2.35 | 1.17 | 1.00 | 1.98 | 2.31 | 1.02 | 1.25 | 1956 |
| 1955 | 1832 | 1408.00 | 1.88 | 2.23 | 42.70 | 2.29 | 1.19 | 0.75 | 2.51 | 2.97 | 1.03 | 1.21 | 1955 |
| 1954 | 1745 | 1335.00 | 1.81 | 2.14 | 40.60 | 2.20 | 1.18 | 0.75 | 2.41 | 2.85 | 1.03 | 1.24 | 1954 |
| 1953 | 1953 | 1543.00 | 1.77 | 2.07 | 41.10 | 2.14 | 1.17 | 0.75 | 2.36 | 2.76 | 1.03 | 1.21 | 1953 |
| 1952 | 1675 | 1321.00 | 1.67 | 1.97 | 40.50 | 2.05 | 1.18 | 0.75 | 2.23 | 2.63 | 1.04 | 1.23 | 1952 |
| 1951 | 1510 | 1220.00 | 1.59 | 1.85 | 39.50 | 1.91 | 1.16 | 0.75 | 2.12 | 2.47 | 1.03 | 1.19 | 1951 |
| 1950 | 1273 | 1004.00 | 1.47 | 1.74 | 41.20 | 1.78 | 1.18 | 0.75 | 1.95 | 2.31 | 1.02 | 1.18 | 1950 |
| 1949 | 1212 | 987.00 | 1.40 | 1.66 | 38.90 | 1.70 | 1.18 | 0.40 | 3.50 | 4.14 | 1.02 | 1.19 | 1949 |
| | | | | | | | | | | | | #VALUE! | |
| 1948 | 1263 | 1031.00 | 1.35 | 1.58 | 38.40 | 1.61 | 1.17 | 0.40 | 3.38 | 3.95 | 1.02 | 1.21 | 1948 |
| 1947 | 1263 | 1038.00 | 1.24 | 1.45 | 39.00 | 1.47 | 1.17 | 0.40 | 3.09 | 3.62 | 1.02 | 1.20 | 1947 |
| 1946 | 764 | 588.00 | 1.13 | 1.36 | 38.70 | 1.37 | 1.20 | 0.40 | 2.82 | 3.39 | 1.01 | 2.15 | 1946 |
| 1945 | | | 0.99 | 1.26 | 36.50 | 1.23 | 1.27 | 0.30 | 3.29 | 4.19 | 0.98 | #DIV/0! | 1945 |
| 1944 | | | | | | | Average | 1.51 | 2.37 | 2.91 | | | |
| | | | | | | | | | 2.28 | 2.81 | | | |

Source: Monthly Labor Survey, various issues.

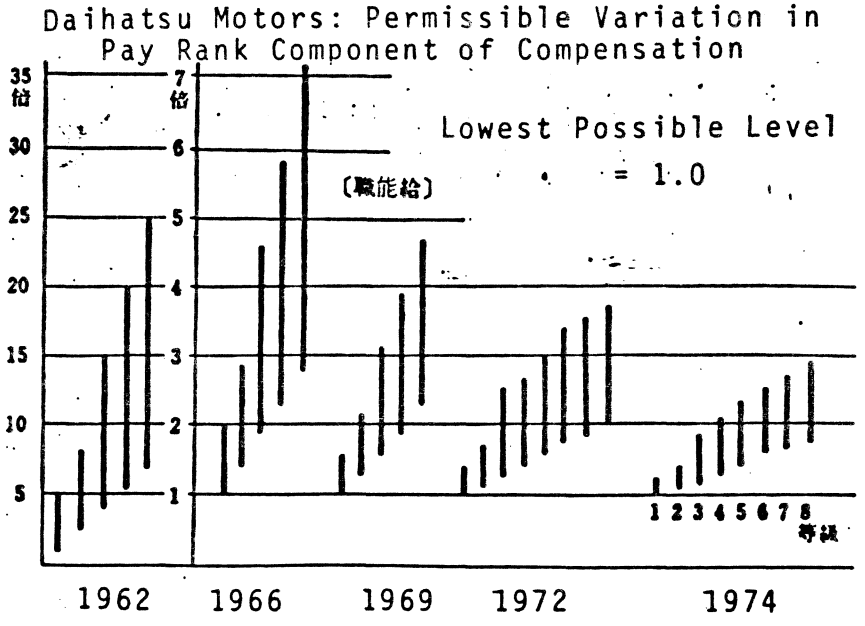
Note that this data does not reflect benefits, which are 40% or more of UAW automotive industry compensation, and have increased in importance since the late 1960's.

Figure 4-1: Large Firm Wages / Small Firm Wages




Source; Odaka (1984), p. 178. Based on 7-year moving average. Adjusted value holds sex, age and blue vs. white collar constant at 1970 weights.

Figure 4-2




Source; Rodosha Chosa Kenkyukai (1983), p.111